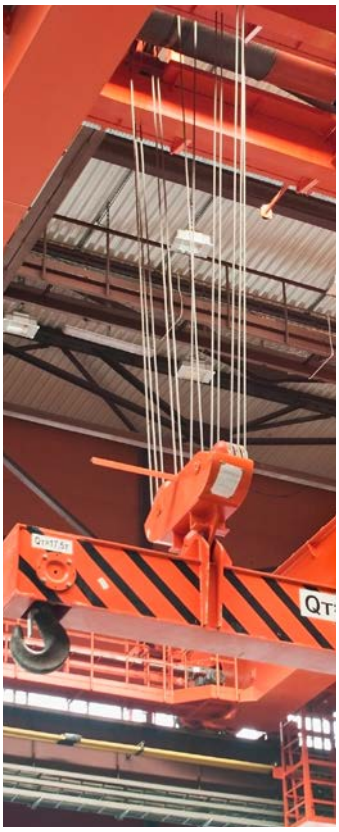
SIME Brakes
Industrial Braking Systems



Stromag®
Altra Industrial Motion

Stromag

Founded in 1932, Stromag has grown to become a globally recognized leader in the development and manufacture of innovative power transmission components for industrial drivetrain applications. Stromag engineers utilize the latest design technologies and materials to provide creative, energy-efficient solutions that meet their customer's most challenging requirements.

Stromag's extensive product range includes flexible couplings, disc brakes, limit switches, an array of hydraulically, pneumatically, and electrically actuated brakes, and a complete line of electric, hydraulic and pneumatic clutches.

Stromag engineered solutions improve drivetrain performance in a variety of key markets including energy, off-highway, metals, marine, transportation, printing, textiles, and material handling on applications such as wind turbines, conveyor systems, rolling mills, agriculture and construction machinery, municipal vehicles, forklifts, cranes, presses, deck winches, diesel engines, gensets and stage machinery.

VISIT US ON THE WEB AT **STROMAG.COM**

Altra Motion

Altra is a leading global designer and producer of a wide range of electromechanical power transmission and motion control components and systems. Providing the essential control of equipment speed, torque, positioning, and other functions, Altra products can be used in nearly any machine, process or application involving motion. From engine braking systems for heavy duty trucks to precision motors embedded in medical robots to brakes used on offshore wind turbines, Altra has been serving customers around the world for decades.

Altra's leading brands include **Ameridrives**, **Bauer** Gear Motor, **Bibby** Turboflex, **Boston** Gear, **Delevan**, **Delroyd** Worm Gear, **Deltran**, **Formsprag** Clutch, **Guardian** Couplings, **Huco**, **Jacobs** Vehicle Systems, **Kilian**, **Kollmorgen**, **Lamiflex** Couplings, **Marland** Clutch, **Matrix**, **Nuttall** Gear, **Portescap**, **Stieber**, **Stromag**, **Svendborg** Brakes, **TB Wood's**, **Thomson**, **Twiflex**, **Warner** Electric, **Warner** Linear and **Wichita** Clutch

VISIT US ON THE WEB AT **ALTRAMOTION.COM**

SIME Brakes

SECURITY - QUALITY - RELIABILITY

With more than 60 years of experience, Stromag provide high efficiency braking systems to equip steel industries, nuclear plants, port cranes, offshore winches and mass transports throughout the world.

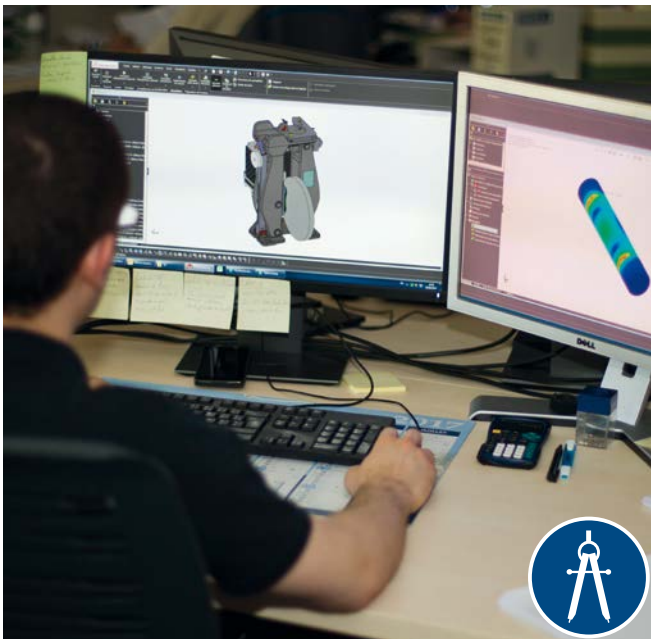
Quality and innovation have always been the two essential features in the development of the company. Therefore Stromag provide disc brakes certified by recognized authorities such as DNV, ABS, TUV, Loyd's Register and EDF.

In 2018, ISO 9001 certification of our Quality management system was renewed under the version V2015 and our Safety management system was awarded OHSAS 18001 - V2007 certification.

Whatever the application, Stromag meet the global supply requirements with standard or fully customised braking systems solutions.

CONTENT

OUR KNOW-HOW AT YOUR DISPOSAL



RESEARCH & DEVELOPMENT DEPARTMENT

In a mutually beneficial way, Stromag create a strong relationship with their customers in order to understand their needs and provide them the best solution.
With in-depth knowledge and experience in all key applications and markets, our teams keep constantly abreast of every changing needs and market development.

TRAINING

After sales service team can provide to its customers training sessions: upgrade operations on-site or trainings in the production center in La Guerche (France). Each training consists of two parts: theoretical in a classroom and practical in the work-shop.
Topics: products operation, periodic maintenance, settings, fault diagnosis.

BENEFITS

- A team of experts at your disposal
- Reactivity of the interventions
- Study of the specific requirements
- Secured installation

- Optimal operation of the braking systems
- Preventive maintenance
- Expertise sustainability

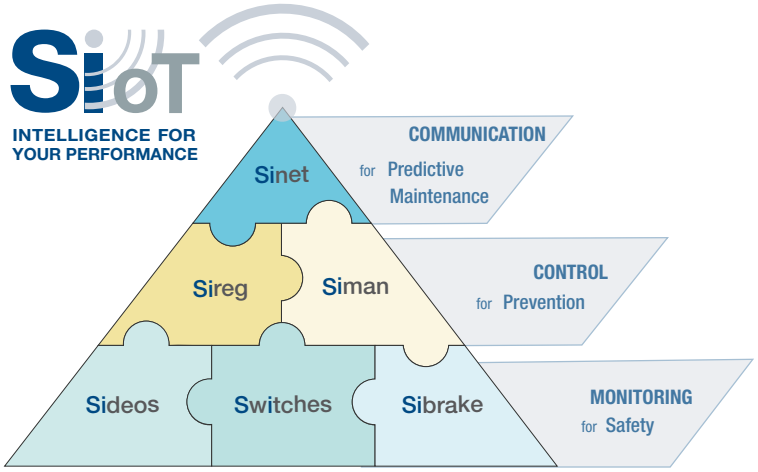
Reactivity, availibility and listening to the customer are values which define our teams. We put all our experience and knowledge at your disposal:

DIAGNOSIS

The After Sales team shares its “know-how” with companies having an important fleet to help them to realise a self-diagnosis on their brakes systems to achieve their maximal reliability in compliance with the safety regulations. The diagnosis takes place in two stages: a complete on-site examination of the different devices and a detailled report with synthesis for a global visibility.

INTERVENTION

Stromag has many sub-structures in France and worldwide, these allow our After Sales Service Department to intervene very quickly at the customer sites.
Each member or our team has a qualified engineering background which means they are well qualified to help and advise customers technically and commercially.

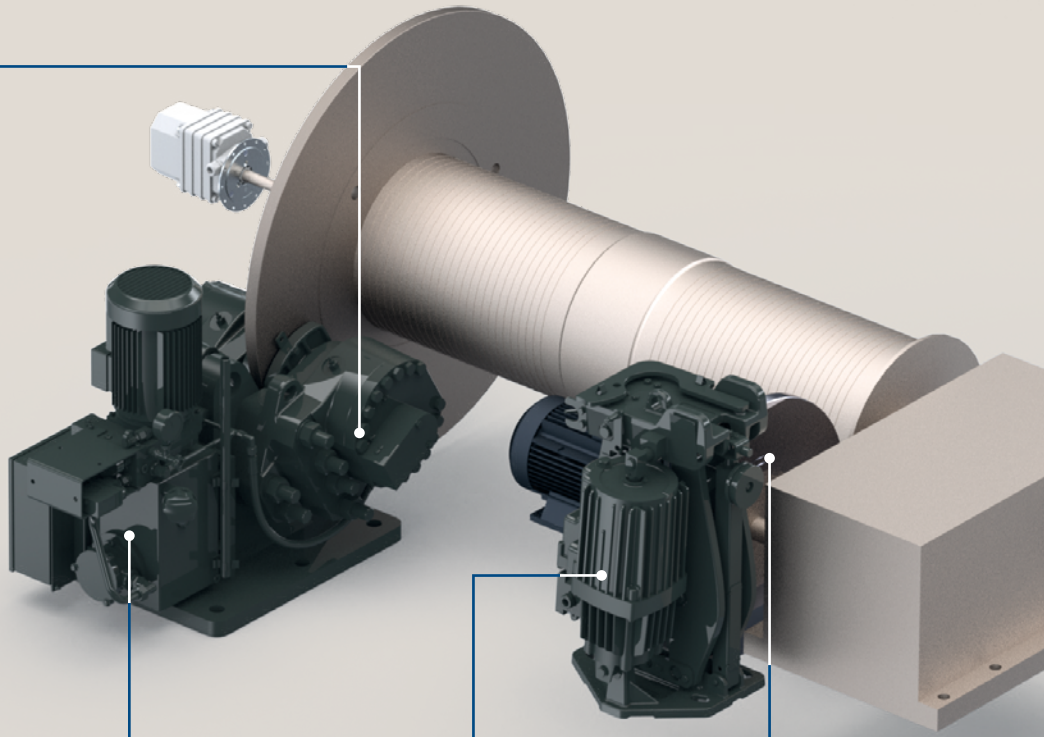


SIoT concept includes several modules, each having specific functions:
Speed Monitoring
- HPP Control and Monitoring
- Regulated Braking - Brake monitoring
- Lifting Monitoring - Information Exchange
- Data process & communication

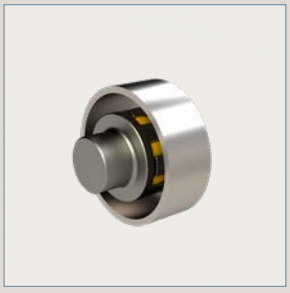
These modules can exchange various information with each other. They can be selected alone or combined accordingly to the installation requirements.

SIME Brakes PRODUCTS

Hydraulic
emergency brakes



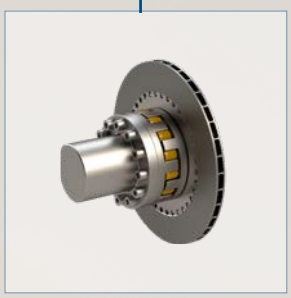
Hydraulic
Power Packs



Drums &
couplings

Drum brakes
with thrustor

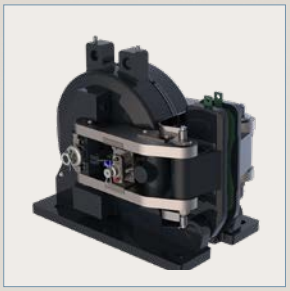
Disc brakes
with thrustor



Discs &
couplings

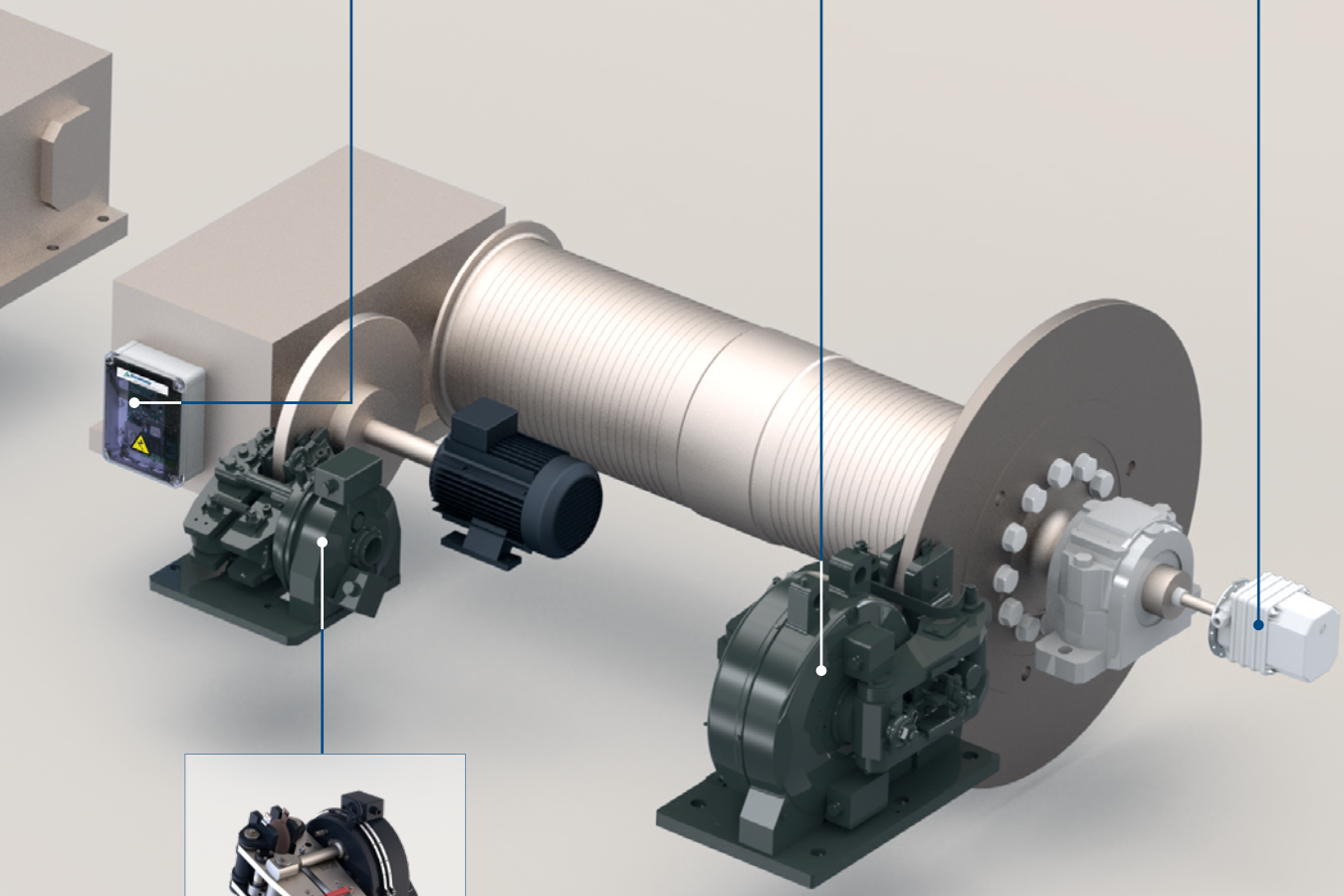
COMPLETE BRAKING SOLUTIONS

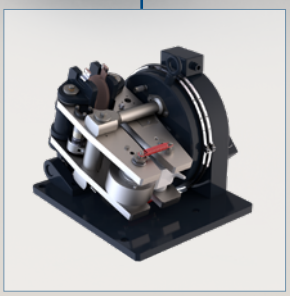
Electrical
power units



Electromagnetic
emergency brakes

Safety systems





Electromagnetic
service brakes

SOLUTIONS FOR YOUR APPLICATION

PORTS

- Ship to shore cranes
- Automated stacking cranes
- Wide span cranes
- Ship loaders
- Stacker Reclaimers
- Tripper cars

MINES & CONVEYORS

- Belt conveyors
- Unloading trippers
- Shot blasting cranes - converters
- Rotary kiln driving
- Slag cranes
- Container gantries

OTHER HOISTING APPLICATIONS

- Cableways
- Ski lifts
- Amusement parks
- Theaters - Eiffel Tower
- Subways
- Ships lifts

CERTIFICATIONS

SIME Brakes products and services comply with the requirements of our customers in terms of quality, safety, service life, easy maintenance and delivery times. The quality and environmental policy is an integral part of our company policy.

The certification ISO9001 of our Quality management system is renewed under the version ISO 9001 - V2015 in 2018, combined with OHSAS 18001 - V2007 certification.

With more than 60 years of experience in the supply of high efficiency braking systems, Stromag provides disc brakes certified by recognised organisations such as DNV, ABS, TUV, Loyd's Register and EDF.


SGS

Stromag France S.A.S.

ISO 9001 : 2015

STEEL INDUSTRIES

- Ladle cranes
- Charging cranes
- Scrap cranes

CONSTRUCTION INDUSTRIES

- Flat top tower cranes
- Luffing jib tower cranes
- MOPS:
  Manual Overload Protection System

Photo courtesy of MORITSCH

HEAVY LIFT OFFSHORE CRANES

- Pipeline laying systems:
  Pipeline tensioners and pull-storage winches
- Cranes on construction vessels
  for the installation of offshore wind turbines

NUCLEAR INDUSTRIES

- Overhead cranes:
  engine room - pumping stations
  fuel and auxiliary buildings
- Polar cranes: reactor buildings
- Fuel descenders

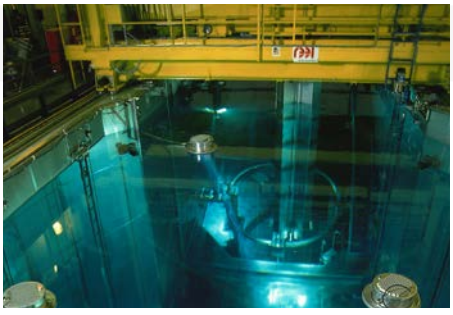
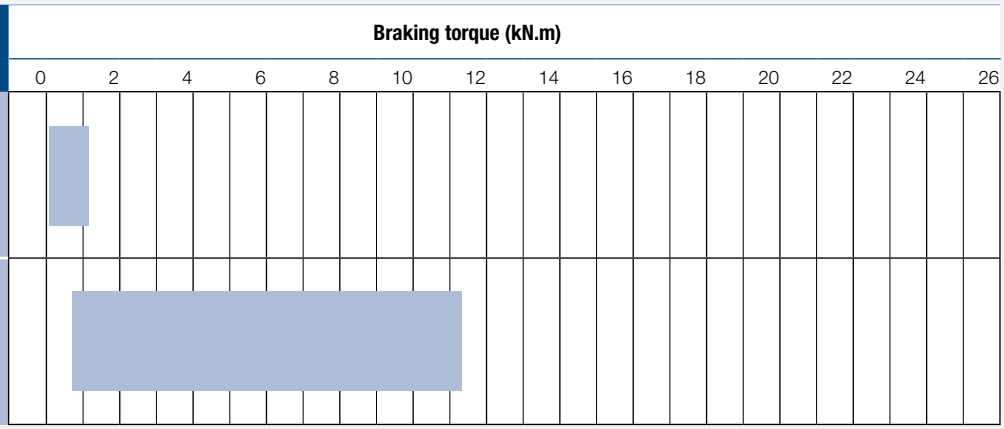


Photo courtesy of EDF

SERVICE BRAKES

Service Brakes

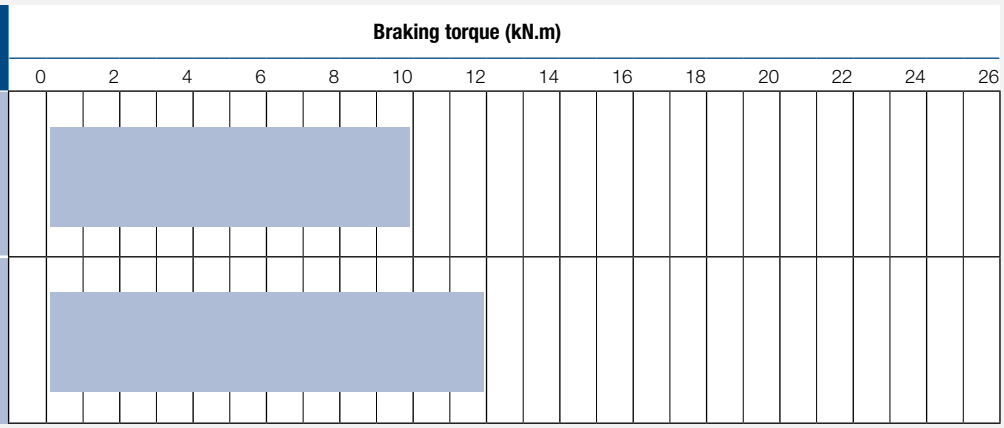
ELECTROMAGNETIC BRAKES



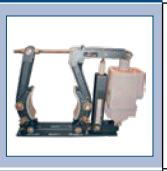
645-650-660
5K / 45 K
discs
Ø175 to 625

1CA2-2CA2
3CA2-4CA2
discs
Ø445 to 995

DRUM BRAKES

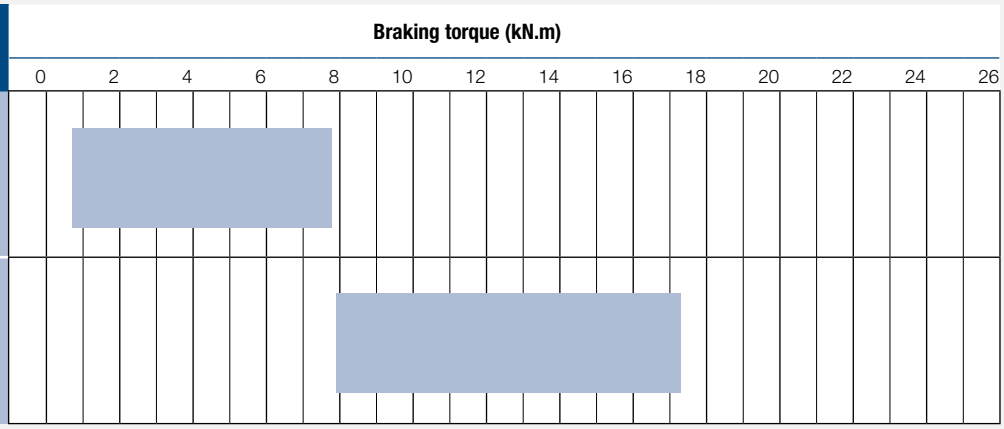


FNS-VS
SDB
drums
Ø160 to 710



SAB
drums
Ø6" to 30"
(Ø152 to 762mm)

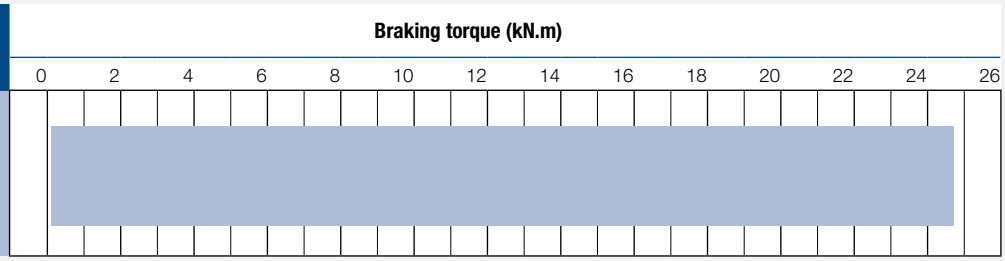
HYDRAULIC BRAKES



2TB-3TB-4TB
discs
Ø445 to 995

1TSA-1TXA
discs
Ø625 to 995

THRUSTOR BRAKES

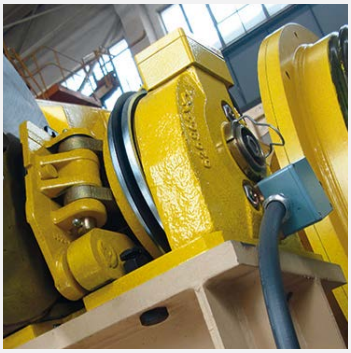


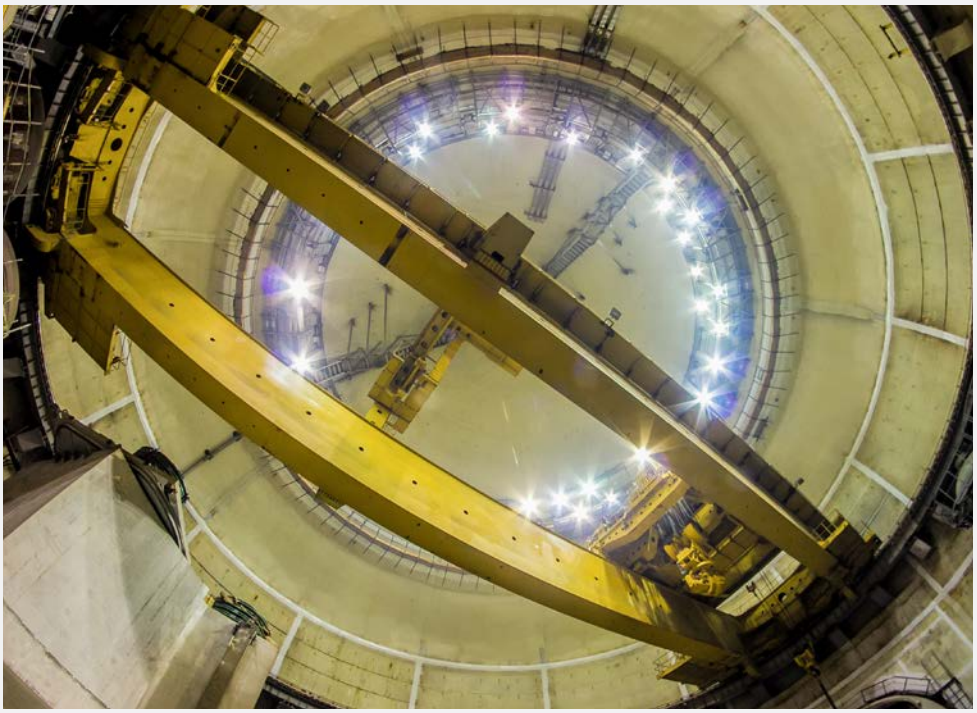
TDXB I and II
FAV 10 to 50
discs
Ø220 to 995

Service Brakes

APPLICATIONS

- STEEL CRANES
- PORT CRANES
- NUCLEAR CRANES
- MASS TRANSPORTS





ELECTROMAGNETIC SERVICE BRAKES

MAIN CHARACTERISTICS

- FAILSAFE BRAKE BY SPRING APPLICATION
- ELECTROMAGNETIC RELEASE
- OPENING PROVING SWITCH

OPTIONS

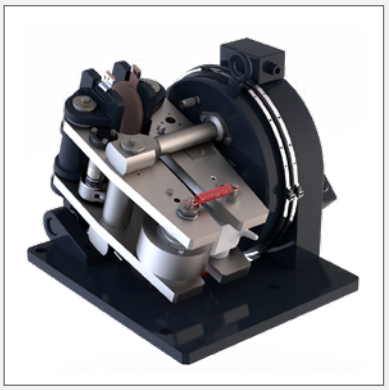
- MECHANICAL RELEASE LEVER
- HYDRAULIC RELEASE
- CLOSING PROVING SWITCH
- MANUAL RELEASE CONTROL SWITCH
- HIGH TEMPERATURE, IRON AND STEEL CONDITIONS

645-650-660

- Association with discs Ø175 to 625
- Manual wear compensation
- Option:
  Mounting on a vertical axis disc

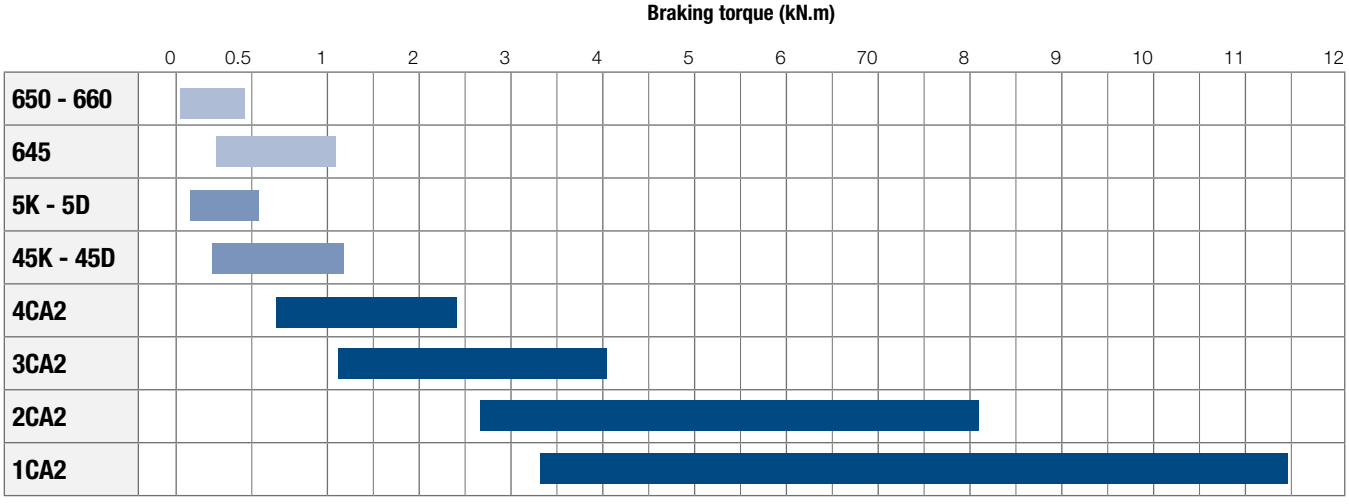
5K - 5D
45K - 45D

- Association with discs Ø315 to 625
- Automatic wear compensation
- Option:
  Mounting on a vertical axis disc



4CA2 - 3CA2
2CA2 - 1CA2

- Association with discs Ø445 to 995
- Automatic wear compensation
- Left and right hand calipers
- Option: Manual wear compensation



Service Brakes

DISC BRAKE - 650 AND 660 CALIPERS

Revision number: T03150-01-G **Revision date: 10.04.2018**

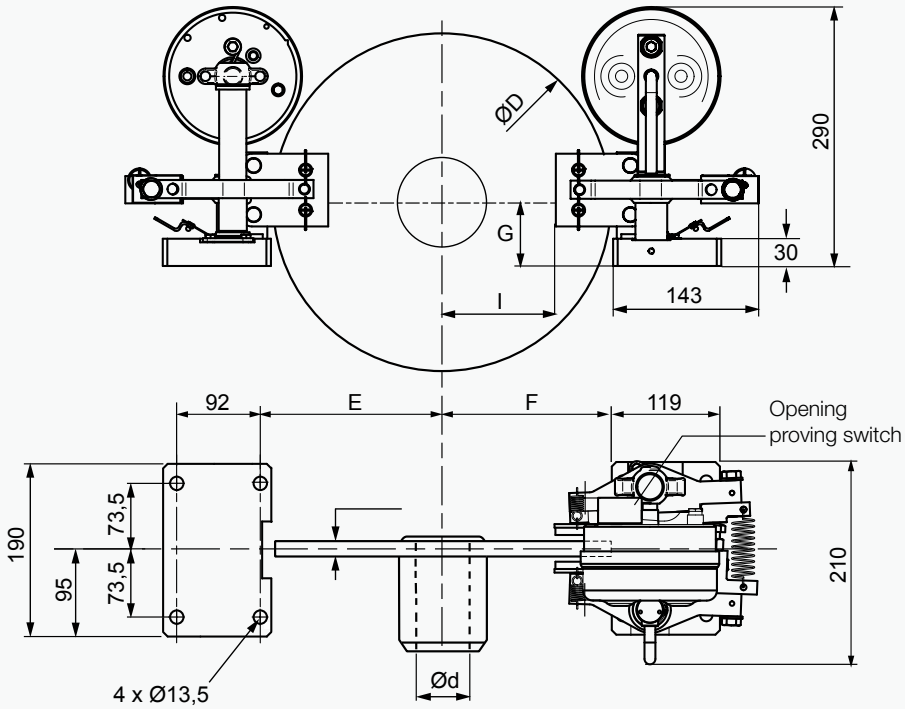
Fail safe braking
Spring application
Electromagnetic release
Manual lining wear compensation
Brake pads with wear indicator
Opening proving switch for PLC
With coil supply wire: 2 x 2mm², length 2m

Conditions of use:
- Ambiant temperature -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult SIME-Stromag.

Use:
- Service brake for application ≤ 150 stops/h

Options:
- Lowering system with lever
- Hydraulic lowering system
- Mounting on vertical axis disc
- Marine protection
- Closing proving switch
- Manual release switch



Opening proving switch:
250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

The opening switch is delivered with 3 x 0.75mm² cable, length 2m

Weight: 19 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			Thickness 15 mm									Thickness 30 mm						
Maximum speed of the disc for nominal torque		tr/mn	5000	4300	3600	3000	2400	2100	1900	1800	1500	3000	2700	2400	2100	1900	1800	1500
D		mm	175	220	260	315	395	445	495	550	625	315	355	395	445	495	550	625
d		mm	0-40	0-55	0-75	0-75	0-75	0-75	0-100	0-100	0-100	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	118	128	143	173	213	238	263	293	328	173	193	213	238	263	293	328
F		mm	106	116	131	161	201	226	251	281	316	161	181	201	226	251	281	316
G		mm	85	85	85	75	60	50	45	45	25	75	60	60	50	45	45	25
I (approx. dimension)		mm	43	53	68	98	138	163	188	218	253	98	118	138	163	188	218	253
Caliper 650: Nominal torque for 1 caliper adjustable from 100% to 50%		N.m	110	130	150	190	260	300	350	390	460	190	220	260	300	350	390	460
Max. reaction on shaft	1 caliper	N	1600									1600						
	2 calipers	N	0			260	570	580	560	510	680	260	550	570	580	560	510	680
Caliper 660: Nominal torque for 1 caliper adjustable from 100% to 60%		N.m	55	65	75	95	130	150	175	195	230	95	110	130	150	175	195	230
Max. reaction on shaft	1 caliper	N	800									800						
	2 calipers	N	0			130	285	290	280	255	340	130	275	285	290	280	255	340

DISC BRAKE - 645 CALIPER

Revision number: T03250-01-E **Revision date: 10.04.2018**

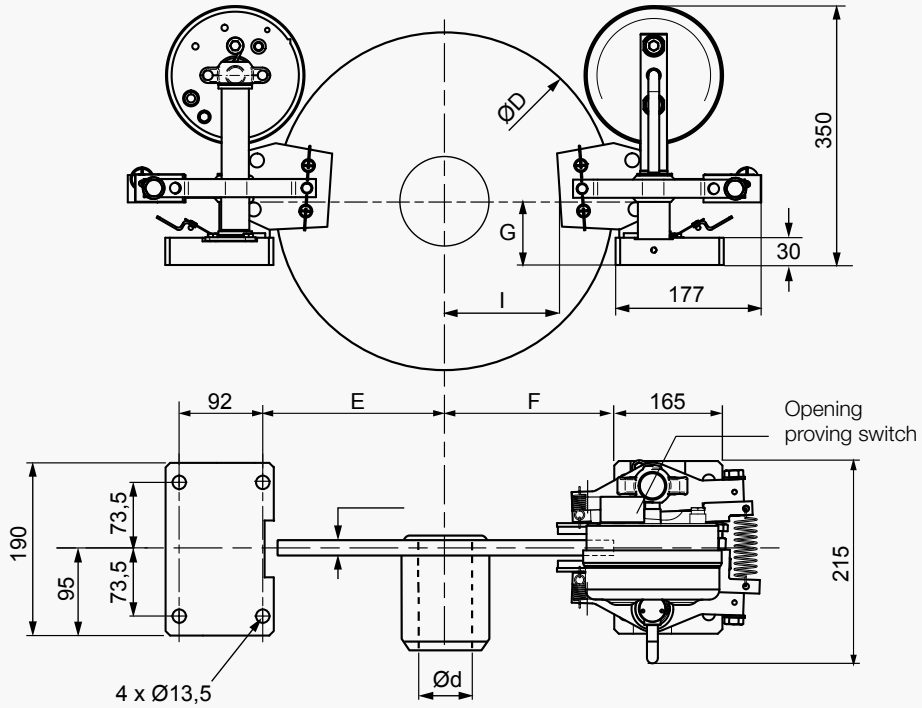
Fail safe braking
Spring application
Electromagnetic release
Manual wear compensation
Brake pads with wear indicator
Opening proving switch for PLC
With coil supply wire: 2 x 2mm², length 2m

Conditions of use:
- Ambiant temperature -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Use:
- Service brake for application ≤ 150 stops/h

Options:
- Lowering system with lever
- Hydraulic lowering system
- Mounting on vertical axis disc
- Marine protection
- Closing proving switch
- Manual release switch



Opening proving switch:
250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

Weight: 35 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Designation	Discs		solid and thickness 15 mm						self-ventilated and thickness 30 mm						
Nominal torque for 1 caliper adjustable from -30% to +20%		N.m	380	520	600	700	780	920	380	440	520	600	700	780	920
Maximum speed of the disc for nominal torque		rpm	3000	2400	2100	1900	1800	1500	3000	2700	2400	2100	1900	1800	1500
D		mm	315	395	445	495	550	625	315	355	395	445	495	550	625
d		mm	0-75	0-75	0-75	0-100	0-100	0-100	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	173	213	238	263	293	328	173	193	213	238	263	293	328
F		mm	161	201	226	251	281	316	161	181	201	226	251	281	316
G		mm	95	80	70	65	65	45	95	80	80	70	65	65	45
l (approx. dimension)		mm	76	116	141	166	196	231	76	96	116	141	166	196	231
Max. reaction on shaft	1 caliper	N	3850						3850						
	2 calipers	N	405	405	810	895	780	1230	405	515	450	810	895	780	1230

Service Brakes

DISC BRAKE - 5K AND 5KR CALIPERS

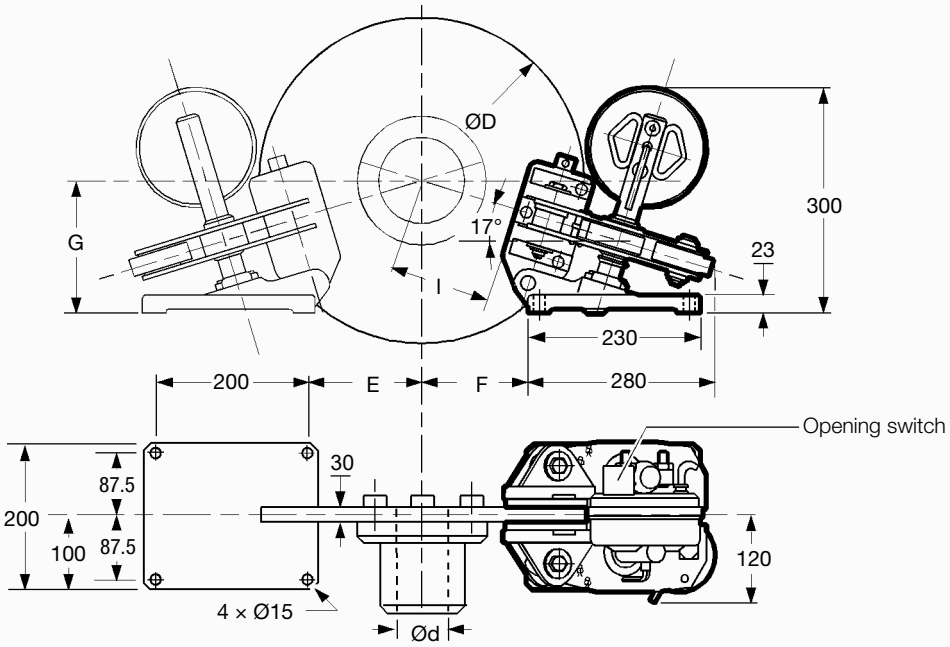
Revision number: T03350-01-E **Revision date: 09.04.2018**

Fail safe braking / Spring application
Electromagnetic release
Automatic wear compensation
Detection of full lining wear
Brake pads with wear indicator
Opening proving switch
Association with discs th. 30mm (or 15mm in option)
With coil supply wire: 2 × 2mm², length 2m

Conditions of use:
- Ambiant temperature - 10°C to + 60°C
- Relative humidity ≤ 70 %
- Dust in atmosphere ≥ 65 µ

Other conditions, consult us.

Options:
- Lowering system with lever
- Hydraulic lowering system
- Marine protection
- Vertical mounting
- Reduced torque
- Closing proving switch
- Manual release switch
- Association with discs th.15mm



Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

The opening switch is delivered with 3 x 0.75mm² cable, length 2m

Weight: 27 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			315	355	395	445	495	550	625
Maximum speed of the disc for nominal torque		rpm	3000	2700	2400	2100	1900	1800	1500
D		mm	315	355	395	445	495	550	625
d		mm	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	100	120	140	160	190	220	255
F		mm	85	105	125	145	175	205	240
G		mm	160	164	170	180	185	195	205
I (approx. dimension)		mm	72	92	113	135	160	197	233
Caliper 5K:									
Nominal torque for 1 caliper adjustable from - 50% to +20%		N.m.	190	220	260	300	350	390	460
Maximum reaction on shaft	1 caliper	N	1950						
	2 calipers	N	1150						
Caliper 5KR:									
Nominal torque for 1 caliper adjustable from 100% to -50%		N.m.	95	110	130	150	175	195	230
Maximum reaction on shaft	1 caliper	N	815						
	2 calipers	N	480						

DISC BRAKE - 5KE CALIPER

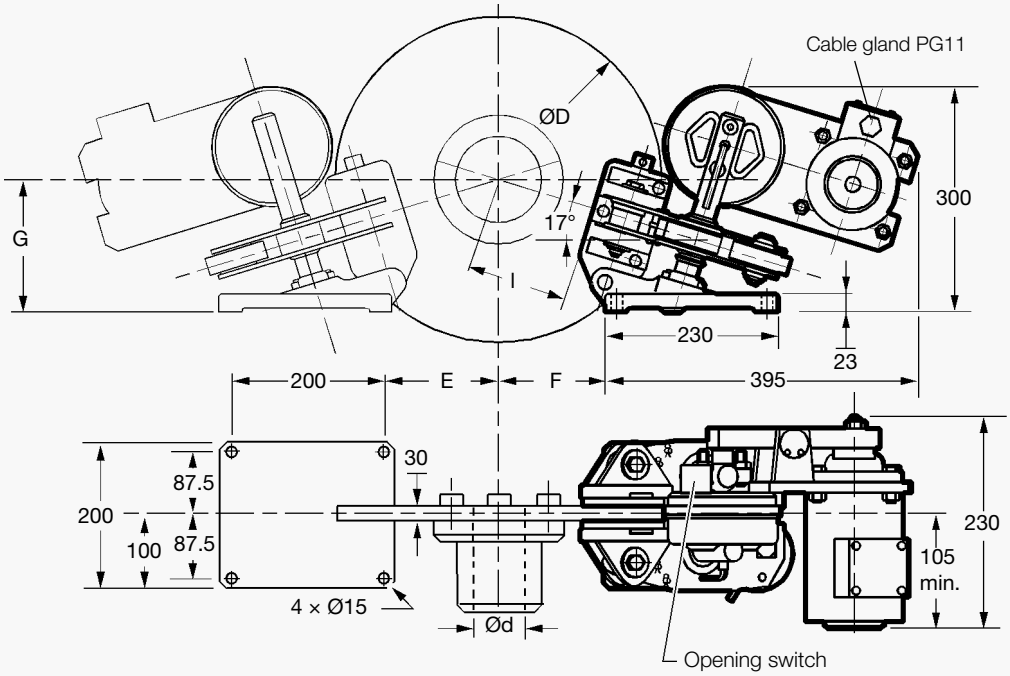
Revision number: T03400-01-D **Revision date: 21.03.2016**

Fail safe braking
Spring application
Electromagnetic release
Electrical progressive braking
Automatic wear compensation
Detection of full lining wear
Opening proving switch
With coil supply wire: 2 × 2mm², length 2m

Conditions of use:
- Ambiant temperature - 10°C to + 60°C
- Relative humidity ≤ 70 %
- Dust in atmosphere ≥ 65 µ

Other conditions, consult us.

Options:
- Hydraulic release
- Marine protection
- Vertical mounting



Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

Opening switch is delivered with 3 x 0.75mm² cable, length 2 m

Weight: 45 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			315	355	395	445	495	550	625
Progressive torque for 1 caliper adjustable from 0% to 100% ✱		N.m	190	220	260	300	350	390	460
Nominal torque for 1 caliper adjustable from 100% to -50%		N.m	190	220	260	300	350	390	460
Maximum speed of the disc for nominal torque		rpm	3000	2700	2400	2100	1900	1800	1500
D		mm	315	355	395	445	495	550	625
d		mm	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	100	120	140	160	190	220	255
F		mm	85	105	125	145	175	205	240
G		mm	160	164	170	180	185	195	205
I (approx. dimension)		mm	72	92	113	135	160	197	233
Maximum reaction on shaft	1 caliper	N	1950						
	2 calipers	N	1150						

✱ For electro with working rate of 40%

Service Brakes

DISC BRAKE - 5D AND 5DR CALIPERS

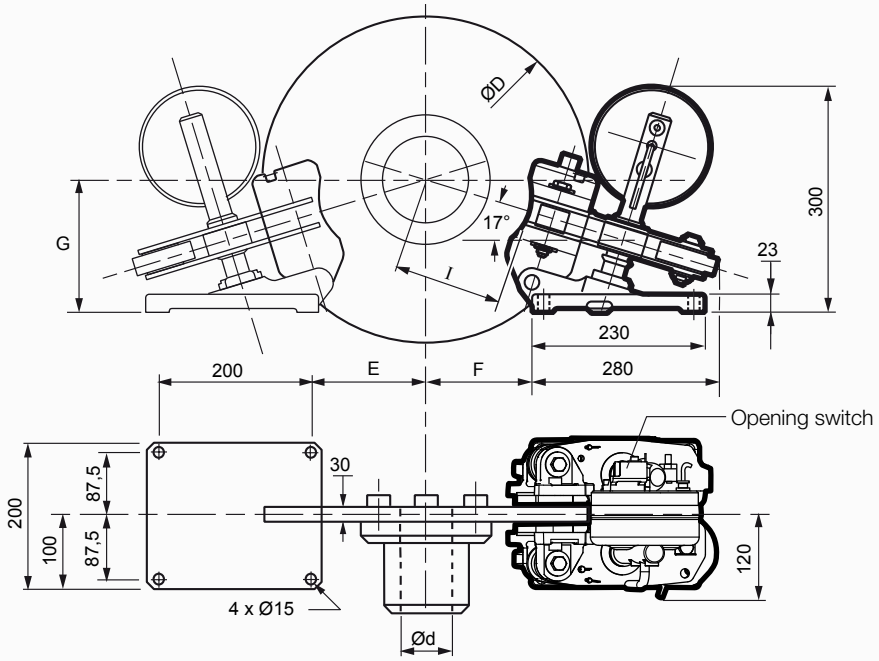
Revision number: T03360-01-E **Revision date: 21.03.2016**

Fail safe braking
Spring application
Electromagnetic release
Automatic wear compensation
Brake pads with wear indicator
Opening proving switch
With coil supply wire: 2 × 2mm², length 2m

Conditions of use:
- Ambiant temperature - 10°C to + 60°C
- Relative humidity ≤ 70 %
- Dust in atmosphere ≥ 65 µ

Other conditions, consult us.

Options:
- Manual release lever
- Hydraulic release
- Marine protection
- Vertical mounting
- Reduced torque
- Closing proving switch
- Manual release switch



Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

The opening switch is delivered with 3 x 0.75mm² cable, length 2m

Weight: 27 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			220 M30	260 M30	315 M30	315	355	395	445	495	550	625
Maximum speed of the disc for nominal torque		rpm	4300	3600	3000	3000	2700	2400	2100	1900	1800	1500
D		mm	220	260	315	315	355	395	445	495	550	625
d		mm	20-55	30-55	35-60	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	65	80	100	100	120	140	160	190	220	255
F		mm	50	65	85	85	105	125	145	175	205	240
G		mm	150	153	160	160	164	170	180	185	195	205
l (approx. dimension)		mm	51	68	88	88	108	128	151	176	213	248
Caliper 5D:												
Nominal torque for 1 caliper adjustable from - 50% to +20%		N.m.	130	150	190	190	220	260	300	350	390	460
Maximum reaction on shaft	1 caliper	N	1950									
	2 calipers	N	1150									
Caliper 5DR:												
Nominal torque for 1 caliper adjustable from 100% to -50%		N.m.	65	75	95	95	110	130	150	175	195	230
Maximum reaction on shaft	1 caliper	N	815									
	2 calipers	N	480									

DISC BRAKE - 5DE CALIPER

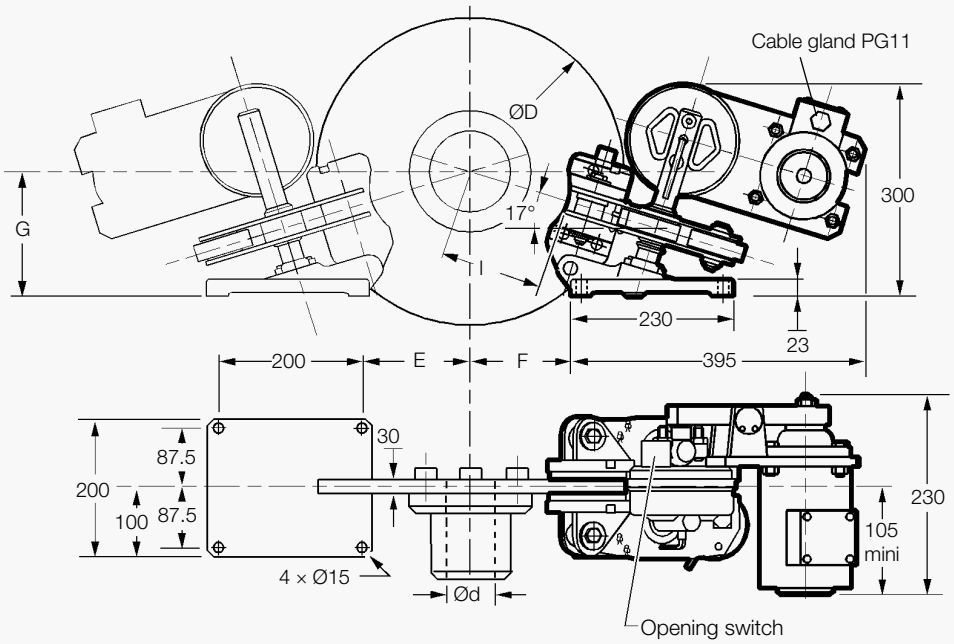
Revision number: T03410-01-D **Revision date: 22.03.2016**

Fail safe braking
Spring application
Electromagnetic release
Electrical progressive braking
Automatic wear compensation
Detection of full lining wear
Opening proving switch
With coil supply wire: 2 × 2mm², length 2m

Conditions of use:
- Ambiant temperature - 10°C to + 60°C
- Relative humidity ≤ 70 %
- Dust in atmosphere ≥ 65 µ

Other conditions, consult us.

Options:
- Hydraulic release
- Marine protection
- Vertical mounting



Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			220M30	260M30	315M30	315	355	395	445	495	550	625
Progressive torque for 1 caliper adjustable from 0% to 100% ✱		N.m	130	150	190	190	220	260	300	350	390	460
Nominal torque for 1 caliper adjustable from 100% to -50%		N.m	130	150	190	190	220	260	300	350	390	460
Maximum speed of the disc for nominal torque		rpm	4300	3600	3000	3000	2700	2400	2100	1900	1800	1500
D		mm	220	260	315	315	355	395	445	495	550	625
d		mm	20-55	30-55	35-60	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	65	80	100	100	120	140	160	190	220	255
F		mm	50	65	85	85	105	125	145	175	205	240
G		mm	150	153	160	160	164	170	180	185	195	205
I (approx. dimension)		mm	51	68	88	88	108	128	151	176	213	248
Maximum reaction on shaft	1 caliper	N	1950									
	2 calipers	N	1150									

✱ For electro with working rate of 40%

Service Brakes

DISC BRAKE - 45K and 45D calipers

Revision number: T00140-01-J **Revision date: 10.04.2018**

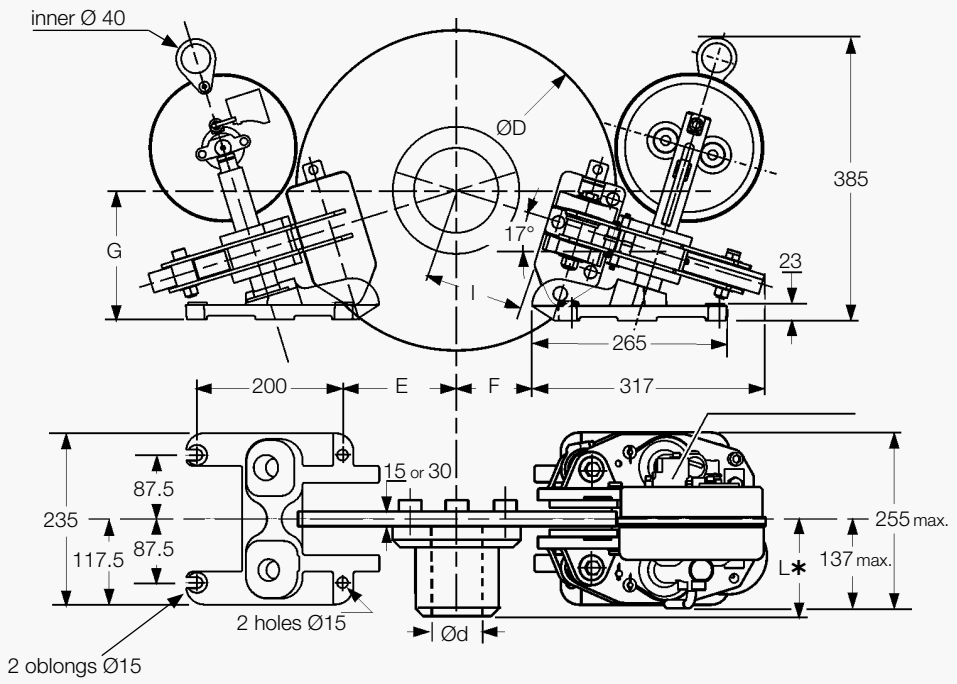
Fail safe braking
Spring application
Electromagnetic release
Automatic linings wear compensation
Opening proving switch
Coil with supply wire: 2 × 2mm², length 2m
Association with 30mm thick discs (or 15mm in option)
Shoes DIN (caliper 45D) for discs thickness 30mm only.

Conditions of use:
- Ambiant temperature -20°C to + 60°C
- Relative humidity ≤ 70 %
- Dust in atmosphere ≥ 65 µ

Other conditions, consult us.

Use:
- Service brake for application ≤ 600 cycles / h
  Possibility of quick manoeuvres:
  1000 cycles/h during 15s every 2 mn

Options:
- Lowering system with lever
- Hydraulic lowering system
- Manual wear compensation (RM)
- Marine protection
- SIDHT steel industry high temperature
- Bearing brackets for mounting in place of a caliper 645.
- Mounting on a vertical axis disc.
- Closing proving switch
- Manual release switch



Note:
The 45K-RM and 45D-RM calipers (manual wear compensation option) have the same overall dimensions as the 45K and 45D calipers with automatic wear compensation.

∗ ATTENTION
For discs Ø315 to 395, the length of 137 max. is higher than the length L of the standard hub. Provide space at the rear of the hub by means of a spacer.

Opening proving switch:
250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

Weight: 41 kg
Dimensions in mm

Response time at nominal torque: see the leaflet of the associated electrical power supply.
Caliper delivered in standard with WS1-5 lining.
For energy applications. use WS1-3 (torque loss of 20%).

Designation		Discs	solid and thickness 15 mm (option)							ventilated and thickness 30 mm						
D Disc diameter		mm	**315**	**355**	**395**	**445**	**495**	**550**	**625**	**315**	**355**	**395**	**445**	**495**	**550**	**625**
Nominal torque for 1 caliper adjustable from -30% to +20%		N.m	410	470	560	650	750	840	990	410	470	560	650	750	840	990
Maximum speed of the disc for nominal torque		r.p.m.	3000	2700	2400	2100	1900	1800	1500	3000	2700	2400	2100	1900	1800	1500
d		mm	0-75	0-75	0-75	0-75	0-100	0-100	0-100	0-50	0-60	0-70	0-70	0-100	0-100	0-100
E		mm	100	120	140	160	190	220	255	100	120	140	160	190	220	255
F		mm	50	70	90	110	140	170	205	50	70	90	110	140	170	205
G		mm	160	164	170	180	185	195	205	160	164	170	180	185	195	205
I (calipers **45K. 45K-RM**)		mm	75	95	116	138	168	200	236	75	95	116	138	168	200	236
I (caliper **45D**)		mm								75	95	116	138	168	200	236
I (caliper **45D-RM**)		mm								96	116	137	159	189	221	257
Maximum reaction on shaft	1 Caliper	N	4200													
	2 Calipers	N	2450													

DISC BRAKE - 4CA2 CALIPER

Revision number: T10049-01-D **Revision date: 22.03.2016**

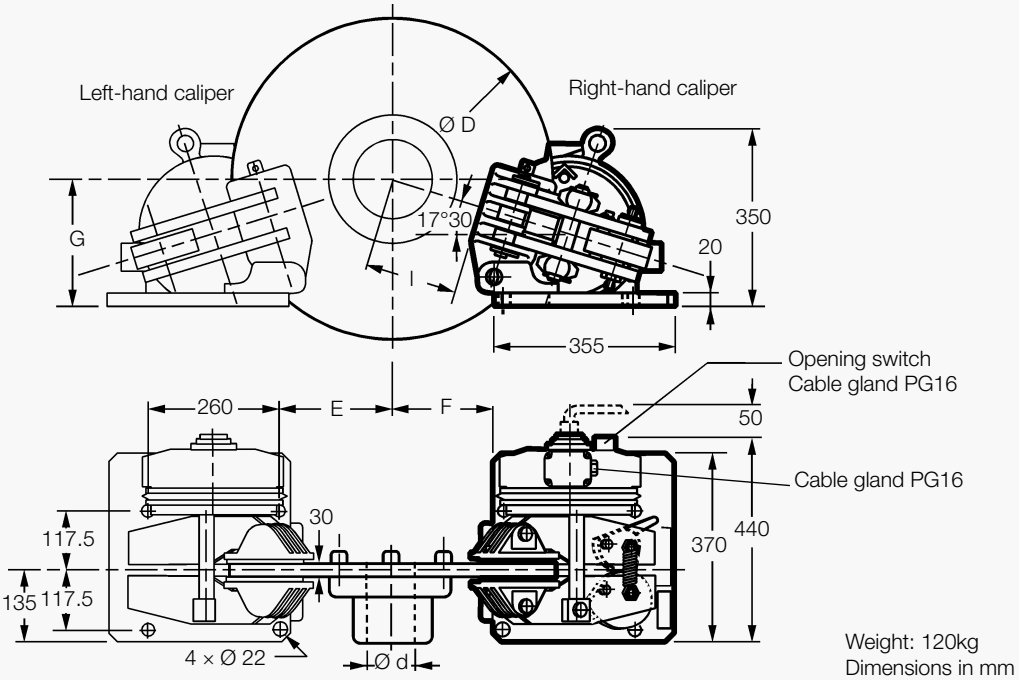
Fail safe braking
Braking by spring application
Electromagnetic release
Automatic wear compensation
Opening proving switch
Brake pads with wear indicator

Working conditions:
- Ambient température: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Use:
Any application up to 1000act/h

Options:
- Manual release lever
- Hydraulic release
- Manual wear compensation
- Flameproof protection
- Marine protection
- Closing proving switch
- Switch on release nut



Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			445	495	550	625	705	795
Nominal torque for 1 caliper adjustable from -30 to +20%		N.m	950	1100	1270	1500	1750	2000
Maximum disc speed for nominal torque		r.p.m.	2100	1900	1800	1500	1300	1200
D		mm	445	495	550	625	705	795
d		mm	0-70	0-100	0-100	0-100	0-120	0-130
E		mm	130	160	180	215	255	295
F		mm	110	140	160	195	235	275
G		mm	225	235	240	250	260	275
I (approx. dimension)		mm	90	125	145	180	225	265
Maximum reaction on shaft	1 caliper	N	7400					
	2 calipers	N	4450					

Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

Service Brakes

DISC BRAKE - 3CA2 CALIPER

Revision number: T10050-01-D **Revision date: 09.04.2019**

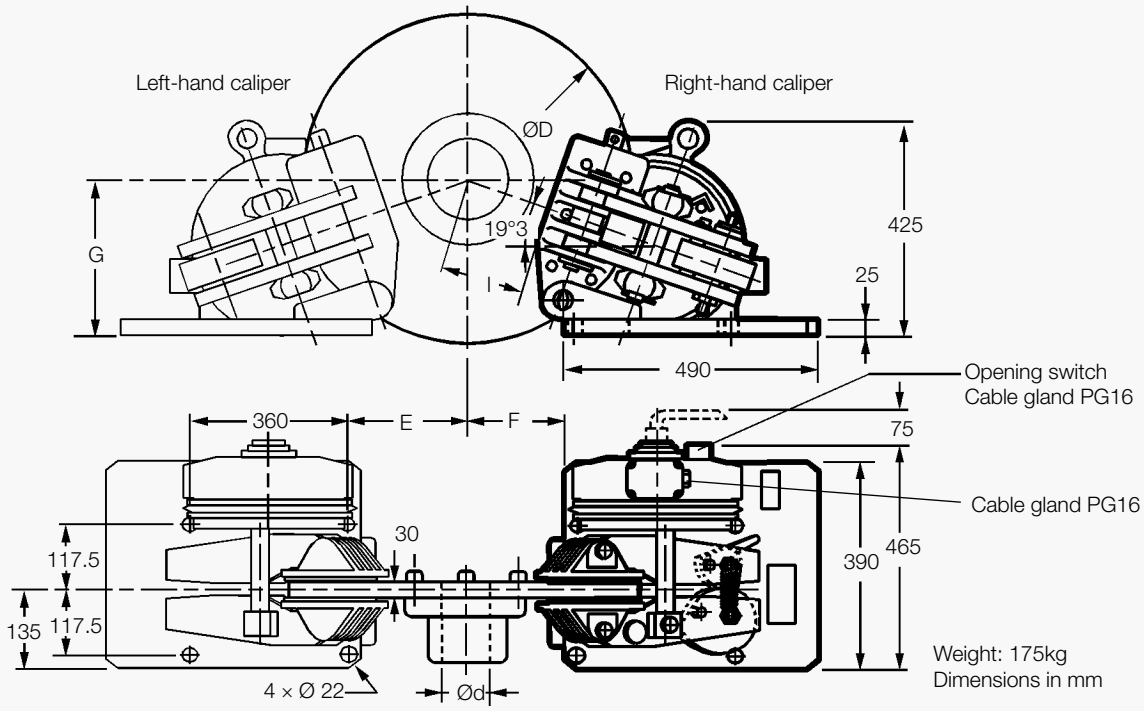
Fail safe braking
Braking by spring application
Electromagnetic release
Automatic wear compensation
Opening proving switch
Brake pads with wear indicator

Working conditions:
- Ambient température: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Use:
Any application up to 1000act/h

Options:
- Manual release lever
- Hydraulic release
- Manual wear compensation
- Load regulated lowering
- Steelworks flameproof protection
- Marine protection / • Special paint
- Closing proving switch
- Switch on release nut



Response time at nominal torque: see the leaflet of the associated electrical power supply.

Discs			445	495	550	625	705	795
Nominal torque for 1 caliper adjustable from -30 to +20%		N.m	1600	1850	2100	2500	2900	3350
Maximum disc speed for nominal torque		r.p.m.	2100	1900	1800	1500	1300	1200
D		mm	445	495	550	625	705	795
d		mm	0-70	0-100	0-100	0-100	0-120	0-130
E		mm	100	120	150	185	225	265
F		mm	80	100	130	165	205	245
G		mm	285	295	305	315	330	345
I (approx. dimension)		mm	90	115	145	180	225	265
Maximum reaction on shaft	1 caliper	N	12300					
	2 calipers	N	7400					

Opening proving switch:
250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

DISC BRAKE - 2CA2 AND 1CA2 CALIPERS

Revision number: T10051-01-D / T10065-02-B **Revision date: 09.04.2019**

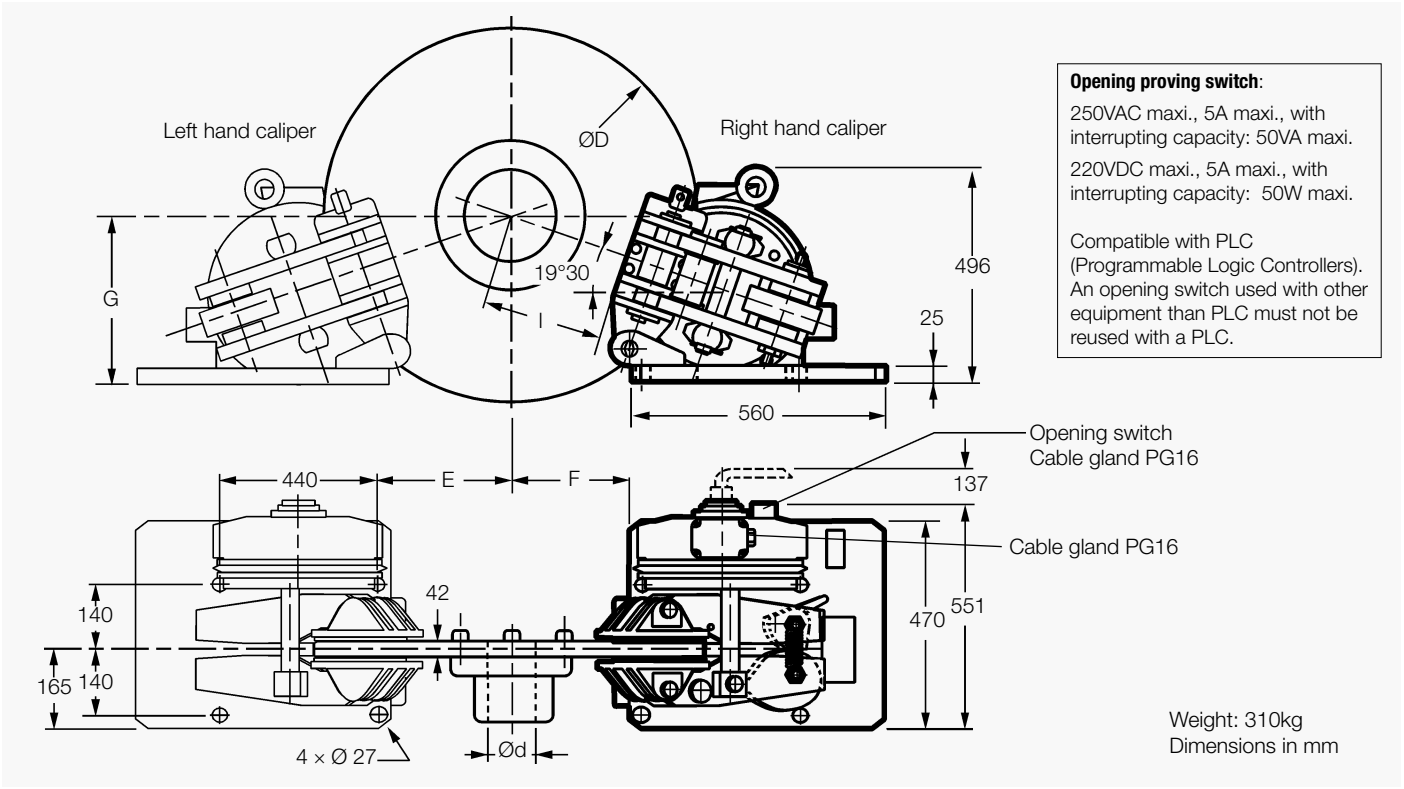
Fail safe braking
Braking by spring application
Electromagnetic release
Automatic wear compensation
Opening proving switch
Brake pads with wear indicator

Working conditions:
- Ambient température: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Use:
Any application up to 600act/h

Options:
- Manual wear compensation
- Steelworks flameproof protection
- Marine protection
- Special paint



Opening proving switch:

250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi.

Compatible with PLC (Programmable Logic Controllers). An opening switch used with other equipment than PLC must not be reused with a PLC.

Discs		625	795	995
D	mm	625	795	995
d	mm	40-140	40-180	40-180
E	mm	157	250	345
F	mm	127	220	315
G	mm	353	385	415
l (approx. dimension)	mm	174	268	368

Response time at nominal torque: see the leaflet of the associated electrical power supply.

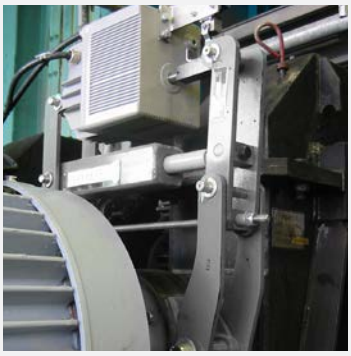
Discs			625	795	995
2CA2					
Nominal torque for 1 caliper adjustable from -30 to +20%		N.m	3 800	5 150	6 700
Maximum disc speed for nominal torque		r.p.m.	1 500	1 200	900
Maximum reaction on shaft	1 caliper	N	18 600		
	2 calipers	N	12 600		

Discs			625	795	995
1CA2					
Nominal torque for 1 caliper adjustable from -50 to 100%		N.m	6 610	8 800	11 370
Maximum disc speed for nominal torque		r.p.m.	310	250	200
Maximum reaction on shaft	1 caliper	N	25 700		
	2 calipers	N	16 300		

Service Brakes

APPLICATIONS

- MINING
- HYDRO POWER
- OIL & GAS
- HARBOUR & SHIPPING
- STEEL
- POWER
- CEMENT

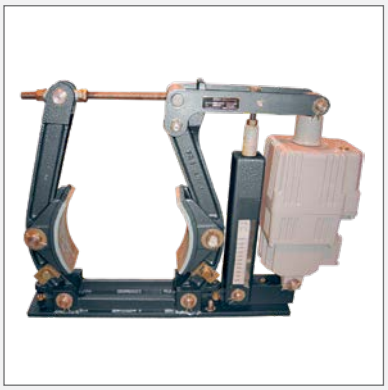


DRUM BRAKES

MAIN CHARACTERISTICS	OPTIONS
• FAILSAFE BRAKES • SPRING APPLIED ELECTROHYDRAULIC THRUSTOR RELEASED • ADJUSTABLE BRAKING TORQUE	• OPENING PROVING SWITCH • FULL LINING WEAR INDICATORS • HAND RELEASE LEVER • HIGH TEMPERATURE, SPECIAL PROTECTION, DELAY. ...

SDB - SAB

- SDB: Drums Ø 160 to 710 mm
  Standard DIN 15435
  Voltage: 230/400VAC 50Hz
- SAB: Drums Ø 6" to 30" (152 to 762mm)
  Standard AISE N.11 - 63.120
  Voltage: 230/460VAC 60Hz

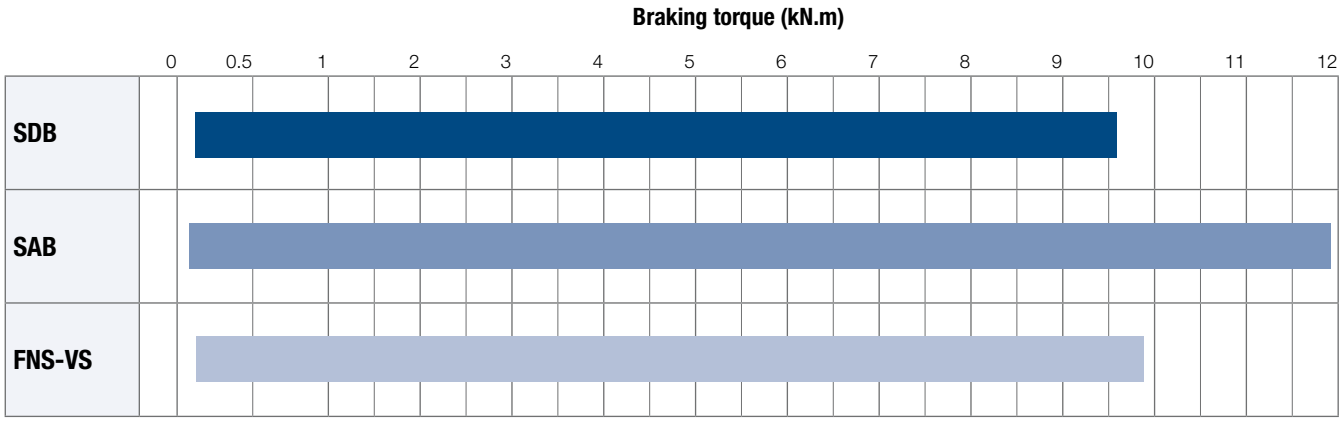


FNS-VS

- Ass. with drums Ø 160 to 710 mm
- Standard DIN 15435
- Voltage: 230/400VAC 50Hz
- Protection C3M
- Option: certificat ATEX / thrustor

FNS-T

- Ass. with drums Ø 160 to 500 mm
- Standard DIN 15435
- Braking torque 60 - 4700 N.m



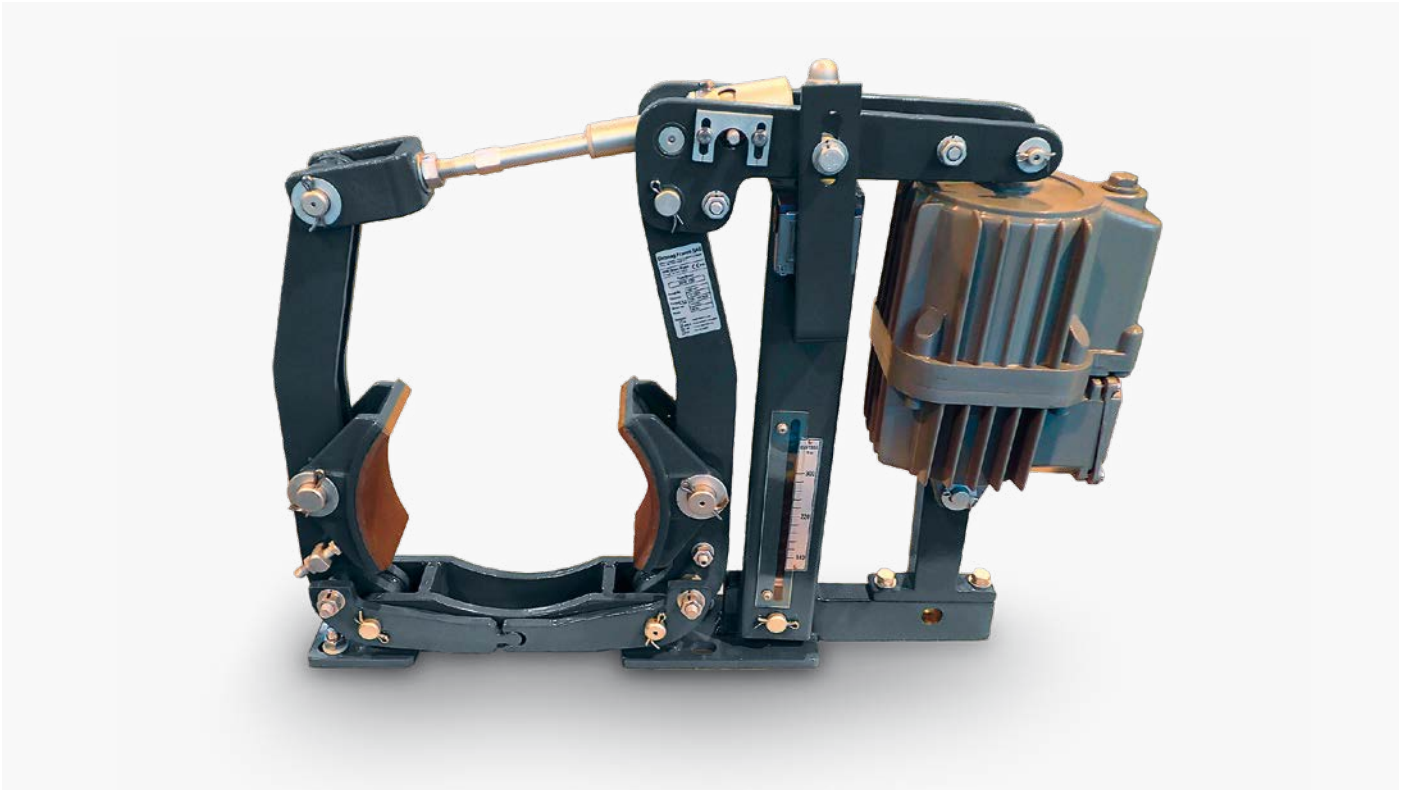
Service Brakes

DRUM BRAKE - SDB BRAKES

Revision number: T10110-01-H **Revision date: 18.10.2021**

Standard **DIN 15435**
- Spring application braking
- Thrustor release
- Standard voltage230/400 VAC 50Hz
- Protection level C4M
- Automatic lining wear compensation
- Brake shoe auto-aligning device
- Scale for torque adjustment
- Brake lever synchronization
- Aluminium shoes with non abestos organic linings
- Self lubricated bushings at main hinge points
- Galvanized steel spindles and hinges

Operating conditions
- Ambient temperature: -20°C to 50°C
- Relative humidity no higher than 90%
- IP rating: IP65



Options:

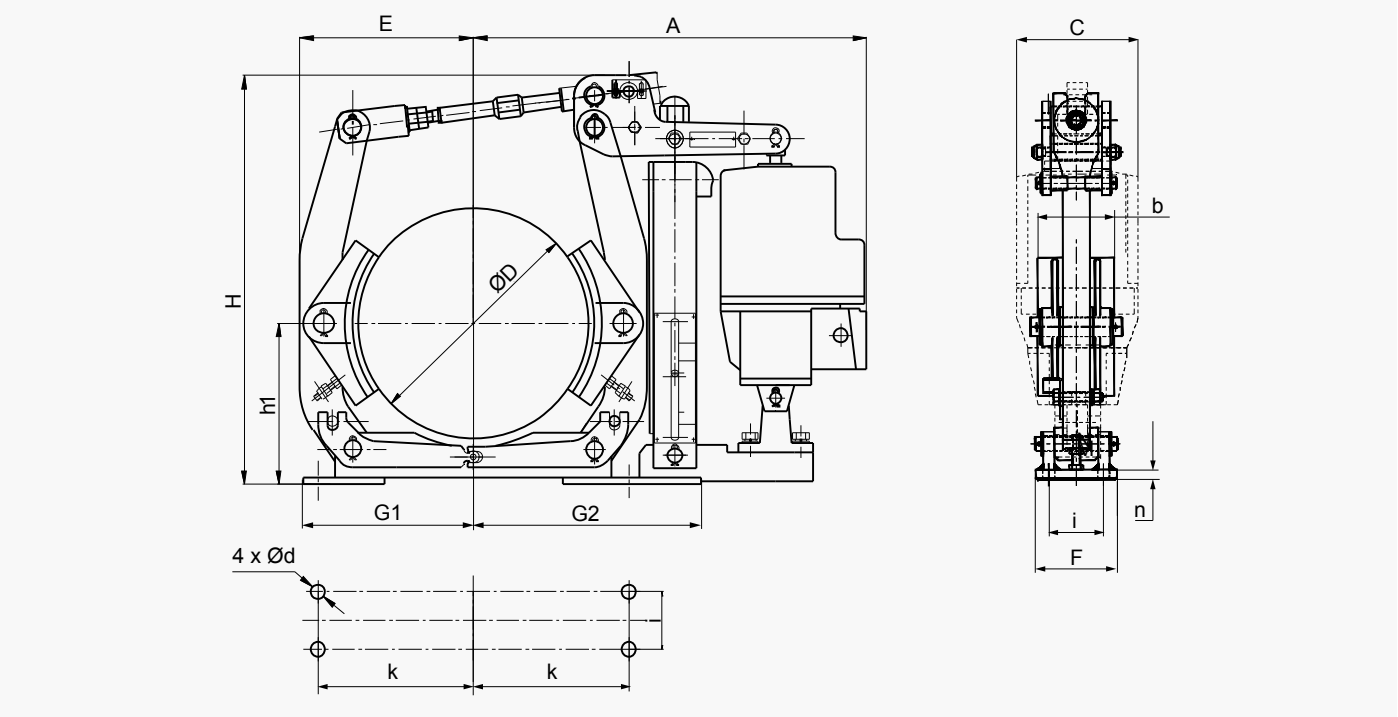
HRL	Manual release lever with or without stop
BRLS	Switch for opening monitoring
LWI	Full lining wear indicators
SS1	Special Switch: Schneider XCKM 110H29
SS2	Special Switch: Schmersal Z4VH335 11Z
AV - DV	Thrustor delay: Ascent Valve or Descent Valve
SV 415V 50Hz **SV 500V 50Hz** **SV 480V 60Hz**	Special Voltage
SW	Steel Works (specific oil in the thrustor + heat resistant sealings)
SPA	Special paint according to the customer

Thrustor Technical Data:

Thrustor type	Power (W)	Current at 400 V (A)	Weight (kg)
TS 230/5	165	0.52	10
TS 300/5	200	0.46	14
TS 500/6	200	0.48	21
TS 800/6	330	1.42	24
TS 1210/6	330	1.44	39
TS 2010/6	450	1.45	39
TS 3010/6	550	1.46	40

DRUM BRAKE - SDB BRAKES

Revision number: T10110-01-H **Revision date: 18.10.2021**



BRAKE TYPE	THRUSTOR	TORQUE (N.m.)		WEIGHT (kg)	DIMENSIONS (mm)													
		min.	max.		A	b	C	D	d	E	F	G1	G2	H	h1	i	k	n
SDB 160	TS 230/5	80	160	28	428	65	160	160	14	140	85	145	195	418	160	55	130	8
SDB 200	TS 230/5	110	260	35	470	70	160	200	14	172	90	165	255	490	160	55	145	10
	TS 300/5	140	380	38														
SDB 250	TS 230/5	140	300	45	533	90	160	250	18	202	110	200	290	583	190	65	180	12
	TS 300/5	180	380	48														
	TS 500/6	300	600	53	570		195											
SDB 315	TS 230/5	180	340	70	670	110	160	315	18	253	115	245	330	585	230	80	220	14
	TS 300/5	250	500	70			195											
	TS 500/6	315	770	75														
	TS 800/6	630	1200	80														
SDB 400	TS 500/6	400	960	138	695	140	195	400	22	310	160	310	420	715	280	100	270	14
	TS 800/6	630	1500	140														
	TS 1210/6	1000	2400	155			240							775				
SDB 500	TS 800/6	800	1920	176	925	180	240	500	22	380	180	365	535	803	340	130	325	21
	TS 1210/6	1250	3000	204										830				
	TS 2010/6	2000	4800	204														
SDB 630	TS 1210/6	1800	3780	310	1150	225	240	630	27	465	220	450	600	1025	420	170	400	20
	TS 2010/6	2500	6000	310														
	TS 3010/6	4000	8500	315														
SDB 710	TS 2010/6	3150	6000	435	1180	225	240	710	27	520	240	500	630	1135	470	190	450	25
	TS 3010/6	5000	9600	441														

Service Brakes

DRUM BRAKE - SAB BRAKES

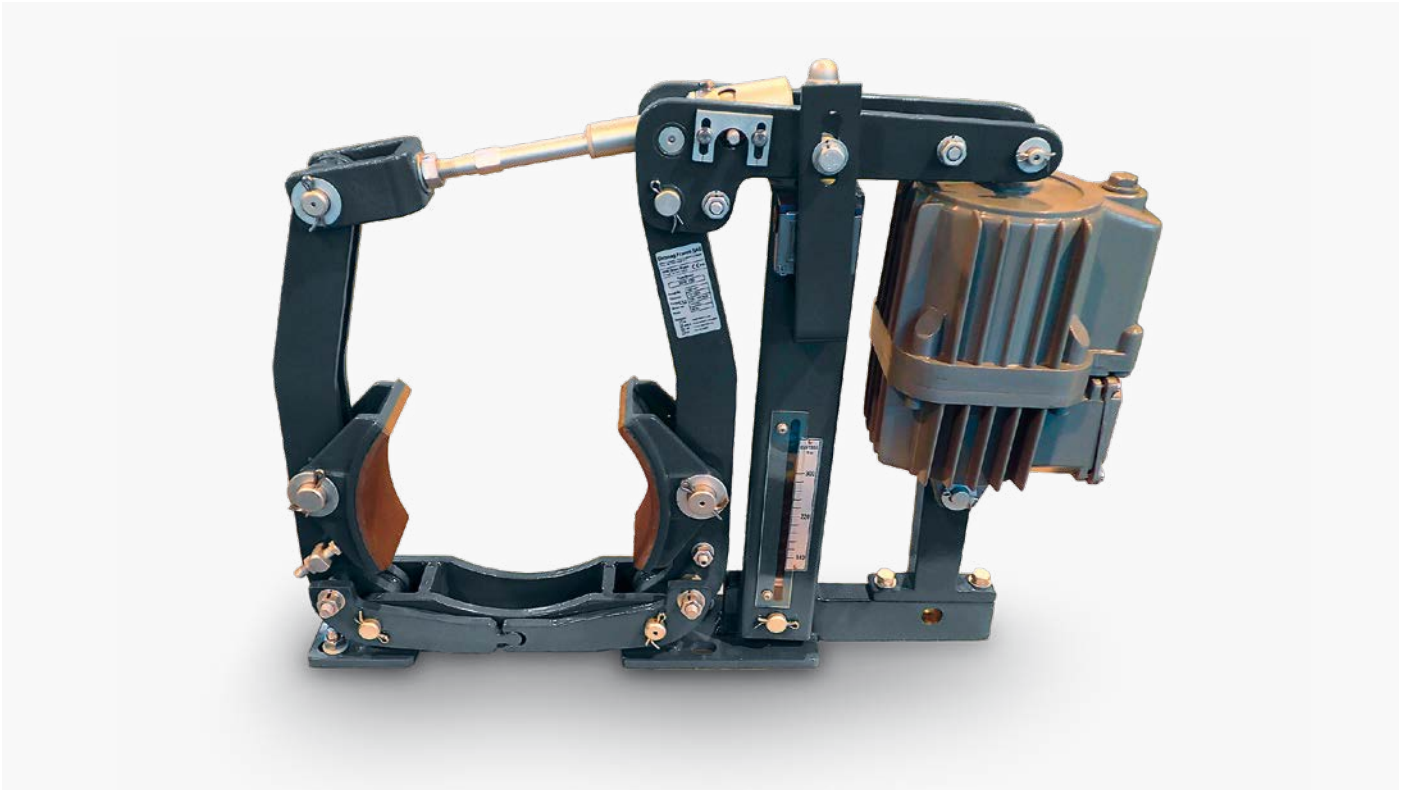
Revision number: T10110-02-G **Revision date: 01.02.2021**

Standard AISE N. 11 - 63.120

- Spring application braking
- Thrustor release
- Standard voltage 230/460 VAC 60Hz
- Paint color RAL7021
- Protection level C4M
- Automatic lining wear compensation
- Brake shoe auto-aligning device
- Scale for torque adjustment
- Brake lever synchronization
- Aluminium shoes with non abestos organic linings
- Self lubricated bushings at main hinge points
- Galvanized steel spindles and hinges

Operating conditions

- Ambient temperature: -20°C to 50°C
- Relative humidity no higher than 90%
- IP rating: IP65



Options:

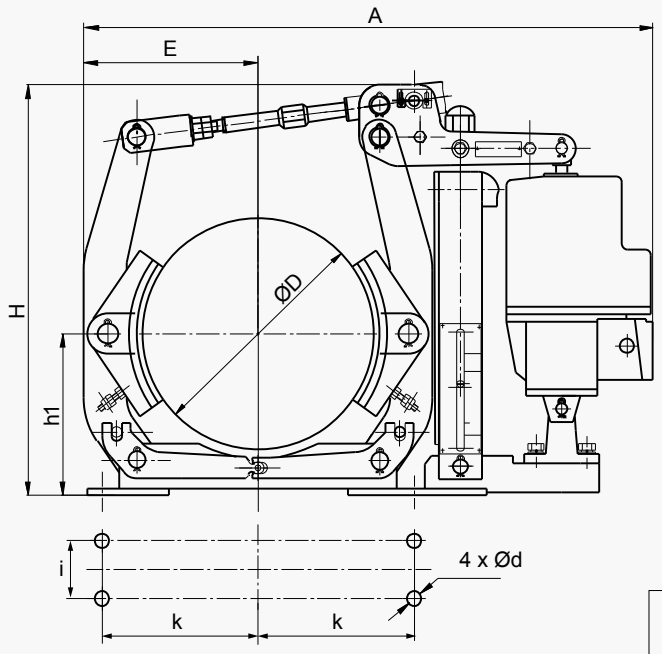
AV - DV	Thrustor delay: Ascent Valve or Descent Valve
BELS	Brake Engaging Limit Switch
BRLS	Brake Release Limit Switch
HRL	Hand release lever with or without stop
HRLM	Switch for hand release monitoring
LWI	Full lining wear indicators
SPA	Paint according to Customer Specification
SV	Special Voltage

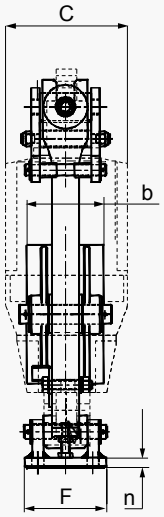
Thrustor Technical Data:

Thrustor type	Power (W)	Current at 400 V (A)	Weight (kg)
TS 230/5	200	0.5	14
TS 300/5	200	0.5	14
TS 500/6	210	0.5	23
TS 800/6	330	1.2	24
TS 1210/6	330	1.2	39
TS 2010/6	450	1.3	39
TS 3010/6	550	1.4	40

DRUM BRAKE - SAB BRAKES

Revision number: T10110-02-G **Revision date: 01.02.2021**





According to satandard **AISE N. 11 - 63.120**

★ Average friction factor of standard material combination μ = 0,4.
All dimensions are in inches. In ( ) mm

Brake type	Thrustor TS	$M_{BR\ MAX}$ (lb-ft) ★	A	b	C	D	d	E	F	H	h1	i	k	n	Weight (lb)
SAB – 6”	230/5	55-110	17	1.65	6.3	6 (152)	3/8 (9.5)	5.5	7.25	16.5	4.75 (120)	3 (76)	4 (102)	0.38	70
SAB – 8”	230/5	85-190	25.16	3.00	6.3	8 (203)	0.69 (17)	6.73	7.28	19.29	7.0 (178)	5.76 (146)	3.25 (83)	0.39	77
	300/5	140-275													84
SAB – 10”	230/5	110-220	28.46	3.54	6.3	10 (254)	0.69 (17)	8.07	7.87	21.65	8.38 (213)	6.26 (160	4.0 (102)	0.47	100
	300/5	140-280													106
	500/6	220-440	29.92		7.48										116
SAB – 12”	300/5	170-345	32.44	5.51	6.3	12 (305)	0.81 (21)	10.40	11.00	23.86	9.88 (251)	9.0 (228)	5.75 (146)	0.55	155
	500/6	270-540	33.6		7.48										164
	800/6	430-855													176
SAB – 13”	300/5	180-375	32.44	5.51	6.3	13 (330)	0.81 (21)	10.40	11.00	23.86	9.88 (251)	9.0 (228)	5.75 (146)	0.55	160
	500/6	295-590	33.6		7.48										164
	800/6	460-930													176
SAB – 15”	500/6	330-665	40.20	6.49	7.48	15 (381)	1.06 (27)	12.20	13.38	28.15	12.13 (308)	10.76 (273)	7.5 (191)	0.55	300
	800/6	515-1030													308
	1210/6	840-1675	39.76		9.45					30.51					335
SAB – 16”	500/6	355-710	40.20	6.49	7.48	16 (406)	1.06 (27)	12.20	13.38	28.15	12.13 (308)	10.76 (273)	7.5 (191)	0.55	304
	800/6	550-1110													308
	1210/6	900-1800	39.76		9.45					30.51					335
SAB – 19”	800/6	665-1330	46.46	8.50	7.48	19 (483)	1.06 (27)	14.64	15.35	30.27	13.25 (337)	13 (330)	9.25 (235)	0.79	445
	1210/6	1055-2110			9.45					32.95					455
	2010/6	1700-3390													455
SAB – 23”	1210/6	1220-2440	53.15	10.98	9.45	23 (584)	1.31 (33)	17.60	18.90	41.0	15.88 (403)	16 (406)	11.75 (298)	0.79	695
	2010/6	1900-3870													695
	3010/6	2850-5760													705
	3010/12	3450-6900													
SAB – 30”	1210/6	1400-2800	70.00	14.01	9.45	30 (762)	1.56 (40)	21.57	22.83	53.34	20.75 (527)	19 (482)	15.0 (381)	1.06	950
	2010/6	2360-4720													950
	3010/6	3650-7370													980
	3010/12	4400-8800													

Service Brakes

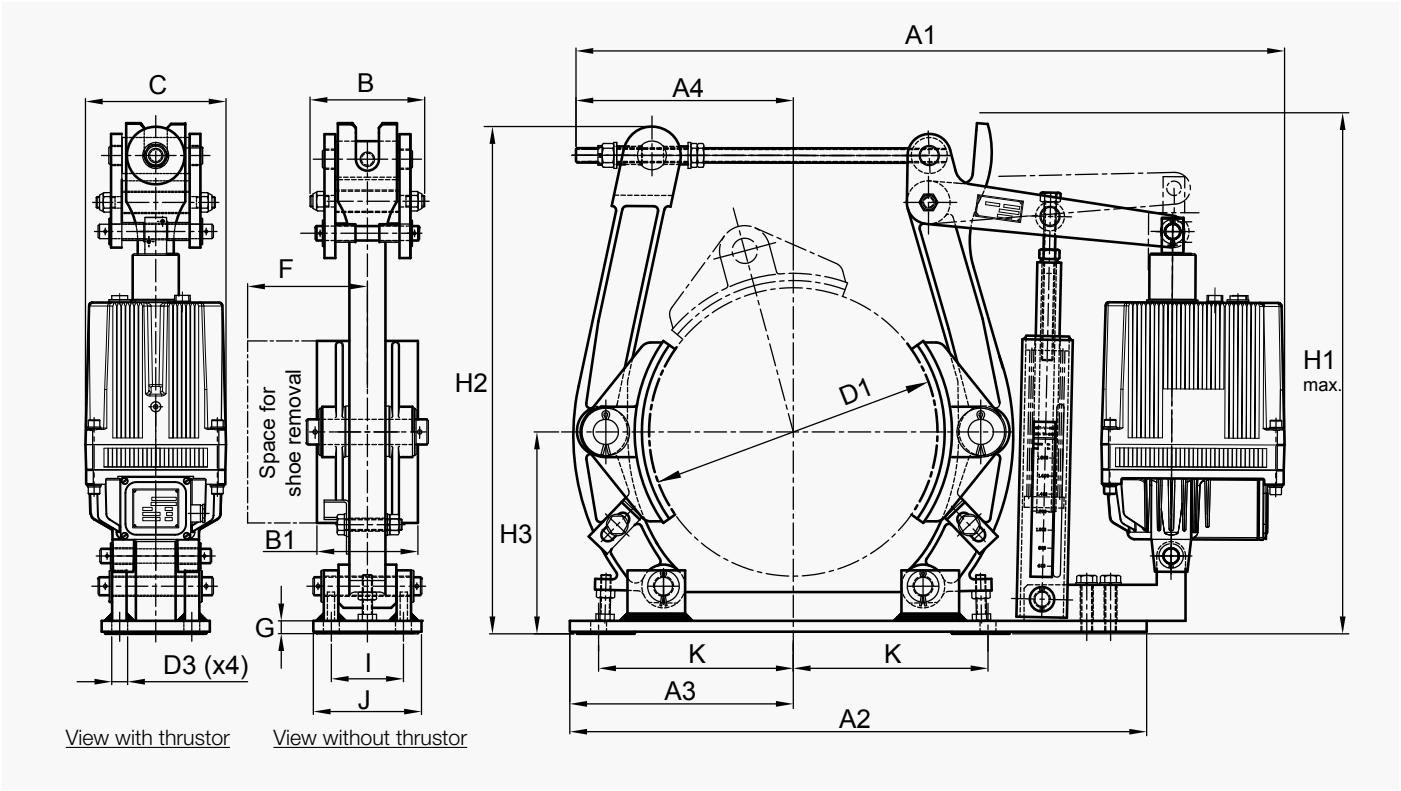
DRUM BRAKE - FNS-VS 160 TO 400 BRAKES

Revision number: T03109-01-E **Revision date: 27.07.2016**

Standard DIN 15435

Spring application
Thrustor release
Protection level: C3M
Voltage: 230 / 400V 50 Hz
Other voltages, consult us.

AT	High temperature
BT	Low temperature
ATEX	Certificat ATEX / Thrustor
BI	Stainless steel bolts
CSA	Opening proving switch
DD	Lining wear indicators
DM	Hand release lever
LM	Locking lever to hold the brake open
PE	Special paint: color / > C3M
PL	Padlock for the locking lever
PR	Reduced torque
RA	Automatic lining wear compensation
VD	Descent valve
	Brake not fitted with the thrustor



BRAKE TYPE	THRUSTOR VS	TORQUE N.m.		WEIGHT kg	DRUM WIDTH	SHOE WIDTH	DIMENSIONS															
		min.	max.			B1	D1	D3	H3	I	K	A1	A2	A3	A4	B	C	F	G	H1	H2	J
160	I-256	118	235	28	60	65	160	11	130	55	120	614	420	140	177	116	160	110	20	424	364	90
200	I-256	125	250	29	75	70	200	14	160	55	145	664	510	185	178	116	160	125	19	405	355	90
	I-356	188	375	34								674								497		
250	I-256	128	255	35	95	90	250	18	190	65	180	710	580	220	210	116	160	130	13	425	413	100
	I-356	235	470	40								760								499		
315	I-356	275	550	59	118	110	315	18	230	80	220	769	690	260	223	159	160	180	18	595	588	120
	II-506	438	875	62								820					195			620		
	II-806	700	1400	63								820					195			635		
400	II-506	450	900	85	150	140	400	22	280	100	270	980	800	310	307	159	195	210	18	710	704	150
	II-806	760	1520	87								990				159	195			710		
	III-1306	1350	2700	107								975				164	240			775		

For higher torque, please consult us. Some types may present little differences in the form with the drawing

DRUM BRAKE - FNS-VS 500 TO 710 BRAKES

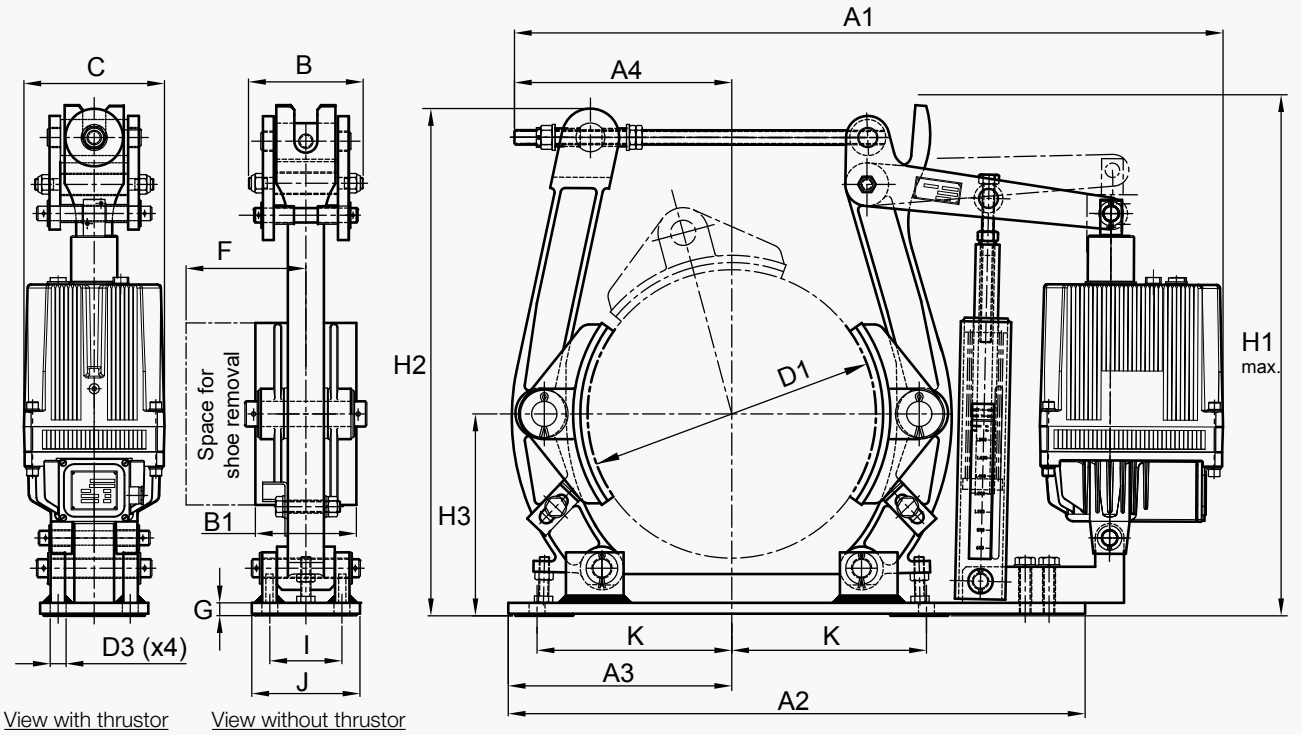
Revision number: T03109-01-E **Revision date: 27.07.2016**

Standard DIN 15435

Spring application
Thrustor release
Protection level: C3M
Voltage: 230 / 400V 50 Hz
Other voltages, consult us.

AT	High temperature
BT	Low temperature
ATEX	Certificat ATEX / Thrustor
BI	Stainless steel bolts
CSA	Opening proving switch
DD	Lining wear indicators
DM	Hand release lever

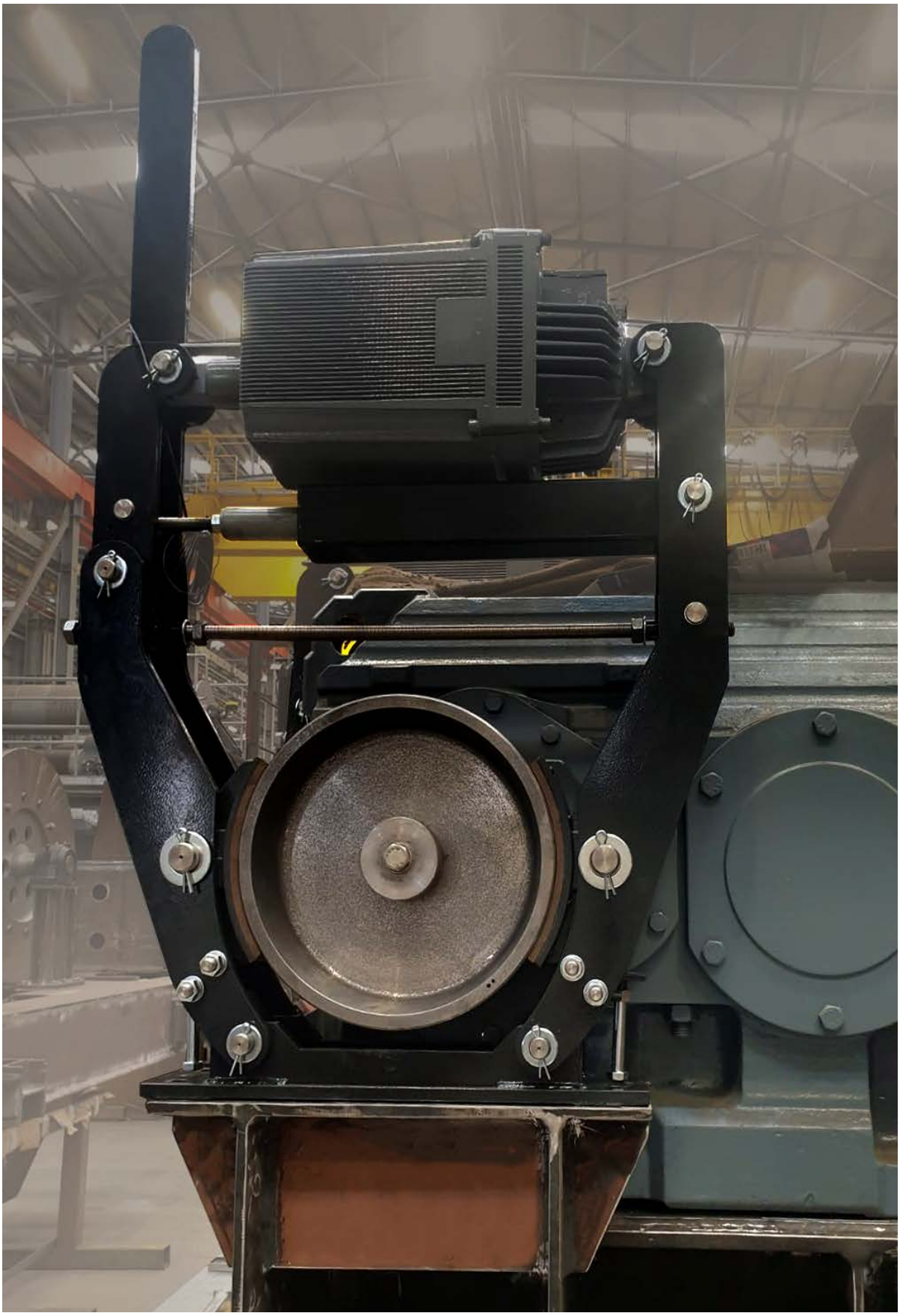
LM	Locking lever to hold the brake open
PE	Special paint: color / > C3M
PL	Padlock for the locking lever
PR	Reduced torque
RA	Automatic lining wear compensation
VD	Descent valve
	Brake not fitted with the thrustor



BRAKE TYPE	THRUSTOR VS	TORQUE N.m.		WEIGHT kg	DRUM WIDTH	SHOE WIDTH	DIMENSIONS															
		min.	max.			B1	D1	D3	H3	I	K	A1	A2	A3	A4	B	C	F	G	H1	H2	J
500	II-806	800	1600	125	190	180	500	22	340	130	325	1039	940	365	312	190	195	250	23	820	803	180
	III-1306	1325	2650	145								1060			325		240					
	III-2006	2125	4250	147								1060			325		240					
630	III-1306	1450	2900	240	236	225	630	27	420	170	400	1240	1150	460	435	230	240	305	23	955	940	220
	III-2006	2325	4650	242								1240			435							
	III-3006	3725	7450	244								1240			435							
	III-3012	3875	7750	258								1325			427							
710	III-2006	2875	5750	323	265	255	710	27	470	190	450	1405	1280	510	470	250	240	340	29	1085	1067	250
	III-3006	4300	8600	324								1405										
	III-3012	4950	9900	338								1570										

For higher torque, please consult us. Some types may present little differences in the form with the drawing

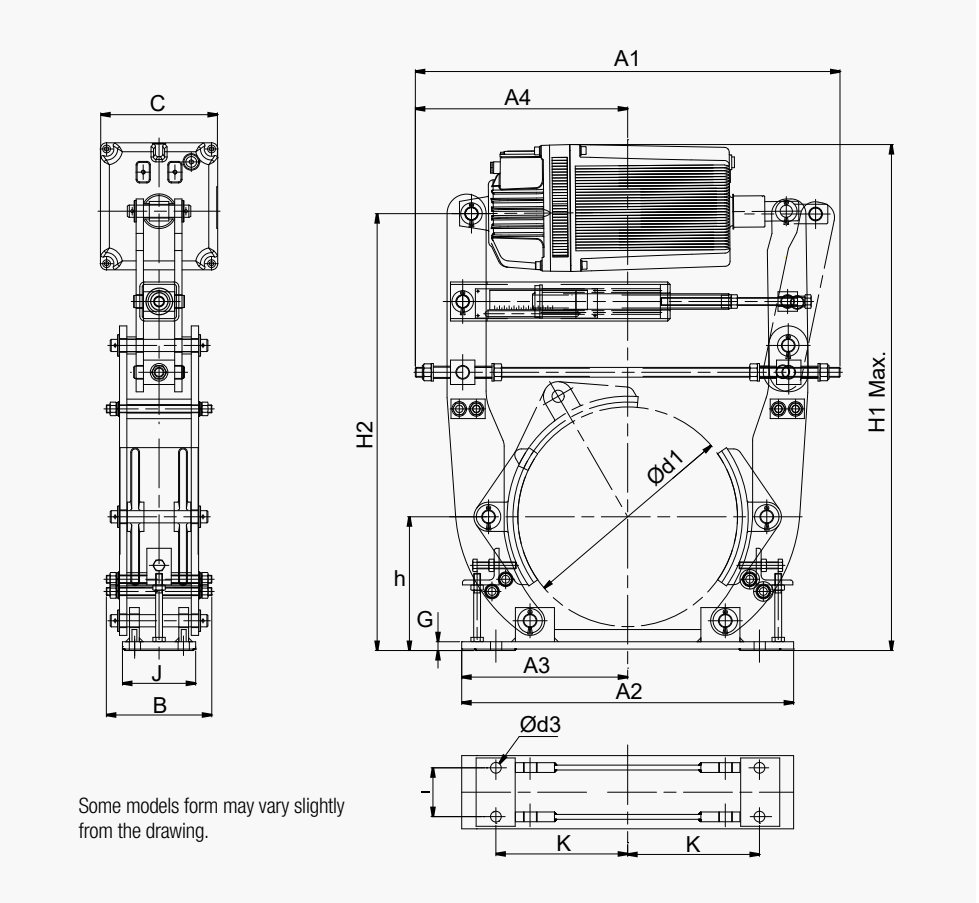
Service Brakes



DRUM BRAKE - FREINS FNS-T

Revision number: T10101-01-A **Revision date: 16.04.2014**

- Standard DIN 15435
- Spring application
- Thrustor release



Some models form may vary slightly from the drawing.

BRAKE TYPE	THURSTOR TYPE	TORQUE Nm		WEIGHT Kg	PULLEY WIDTH	SHOE WIDTH	DIMENSIONS														
		min.	max.				D1	D3	H	I	K	A1	A2	A3	A4	B	C	G	H1	H2	J
160	I-256	60	150	30	80	65	160	11	125	55	108	445	275	137.5	220	135	160	10	546	428	80
200	I-256	90	230	30	75	70	200	14	160	55	145	487	370	185	250	135	160	19	636	518	90
	I-356	110	330	36																	
250	I-256	90	290	37	95	90	250	18	190	65	180	545	440	220	277	153	160	13	756	638	100
	I-356	90	410	42																	
315	I-356	230	570	62	118	110	315	18	230	80	220	600	520	260	310	170	160	18	890	770	120
	II-506	310	780	65													171		900		
	II-806	500	1300	66													171		900		
400	II-506	350	870	89	150	140	400	22	280	100	270	855	620	310	450	215	171	18	1035	906	150
	II-806	580	1450	91													171		1035		
	III-1306	950	2450	112													230		1046		
500	II-506	450	1150	131	190	180	500	22	340	130	325	850	730	365	445	252	171	23	1180	1050	180
	II-806	700	1750	152													171		1180		
	III-1306	1200	3000	154													230		1190		
	III-2006	1800	4700	252													230		1190		

Service Brakes

APPLICATIONS

- PORT CRANES
- ALL HOISTING APPLICATIONS
- TRAVELLING CONTROL
- MASS TRANSPORT
- STEEL CRANES:
  CHARGING AND LADDLE CRANES
  SLAG AND SCRAP CRANES
- BELT CONVEYORS - MINES

HYDRAULIC SERVICE BRAKES

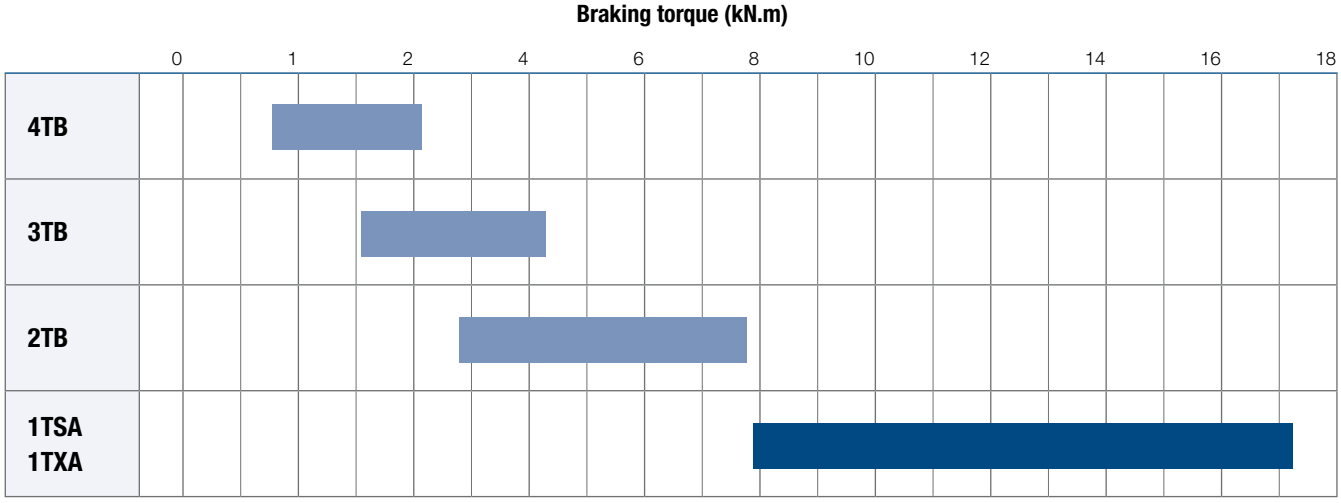
MAIN CHARACTERISTICS	OPTIONS
• FAILSAFE BRAKES • BRAKING BY HYDROSPRING® SYSTEM • INTEGRAL ELECTRICAL CONNECTIONS • INTEGRAL HYDRAULICAL CONNECTIONS • AUTOMATIC WEAR COMPENSATION	• ADJUSTABLE DELAY OF BRAKE CLOSING • MARINE PROTECTION

2TB - 3TB - 4TB

- Association with discs Ø445 to 995
- Options:
  Torque setting
  Controlled braking torque /stepped braking torque
  Protective cover

1TSA - 1TXA

- Association with discs Ø625 to 995
- Torque setting



Service Brakes

DISC BRAKE - 1TSA AND 1TXA CALIPERS

Revision number: T03681-01-A **Revision date: 15.02.2007**

Fail safe
Braking by HYDROSPRING® system
Electrico-hydraulically released
Integral hydraulic power unit
Self contained electrical system
Lining wear compensation
Opening proving switch
Torque setting

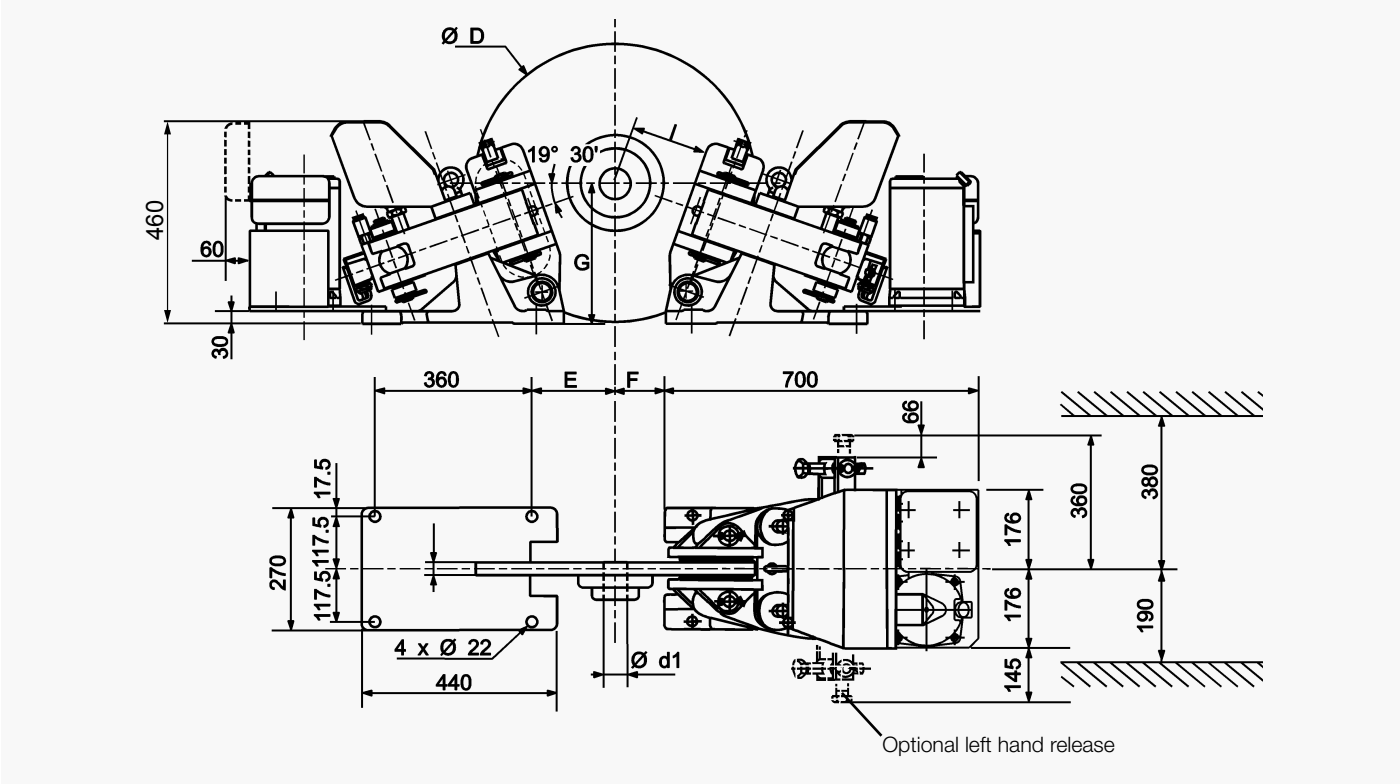
Operating conditions:
- Ambient temperature: -10° C to +50° C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

- **1TXA**:

Mounting of 2 calipers per disc, consult us.

Options:
- Linings with wear detection
- Adjustable delay brake closing system from 0.25 to 20 sec.
- Switch for PLC
- Marine protection



Weight: 160 kg
Response time at nominal torque ≤ 0.25 sec.

Caliper inclination from horizontal ± 15° maxi.
Other inclination, consult us.

Disc	Ø	mm	625		705	795		995
	Thickness	mm	30	42	30	30	42	42
Nominal torque for 1 caliper	**1TSA**	N.m	7920		9180	10620		14040
	1TXA	N.m	9780		11300	13100		17300
Disc speed for the nominal torque ✱		r.p.m.	≤ 1500		≤ 1300	≤ 1200		≤ 900
D		mm	625		705	795		995
E		mm	185		225	265		365
F		mm	125		165	205		305
G		mm	315		330	345		380
I		mm	180		225	265		370
1TSA								
Ø d_1 min. for:	1 caliper (1 key) O	mm	97	97	100	111	111	130
	2 calipers (2 keys) O	mm	--	120	--	--	135	170
1TXA								
Ø d_1 min. for:	1 caliper (1 key)	mm	104	104	111	125	125	145
	1 caliper (shrink fit)	mm	104	104	107	110	110	118
Maximum reaction on shaft:	1TSA ■	N	32 400					
	1TXA	N	40 000					

Electric data:
- 3 phases AC supply
- Voltages:
  230V / 400V ±10% 50Hz
  415V ±5% 50Hz
  460V ±5% 60Hz
- Maximum comsumption: 775 W
- Electrical casing: IP 55
  DC supply, other voltages and conditions: consult us.
- Opening proving switch:
  240V, 3A, 10VA AC
  250V, 0.3A, 10W DC

✱ For higher speed, consult us.

O or shrink fit

■ Mounting with 2 calipers: multiply by 0.6

DISC BRAKE - 2TB. 3TB AND 4TB CALIPERS

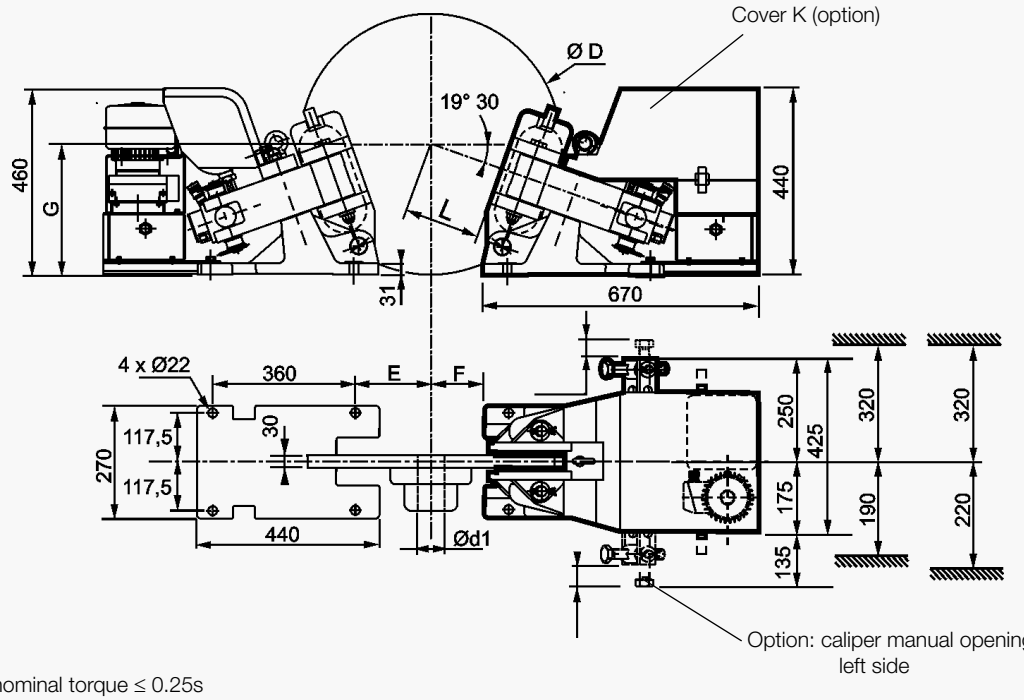
Revision number: T03664-01-C **Revision date: 24.08.2012**

Fail safe
Braking by HYDROSPRING® system
Electrico-hydraulically released
Integral hydraulic power unit
Self contained electrical system
Lining wear compensation
Opening proving switch

Operating conditions:
- Ambient temperature: -10°C to +50°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Options:
- Torque setting • Detection of full lining wear
- Adjustable delay brake closing system from 0.25 to 20secs
- Controlled braking torque **
- Marine protection • Protective cover K
- Stepped braking torque **
- Redundant circuit with 2 solenoid valves



Weight:160 kg
Response time at nominal torque ≤ 0.25s
Permissible inclination of the caliper ± 45° maximum
Other mountings: consult us.

Discs			445	495	550	625	705	795	995
Nominal torque for 1 caliper:	**2TB**	N.m	2800	3250	3700	4400	5100	5900	7800
	3TB	N.m	1550	1800	2050	2450	2850	3250	4300
	4TB	N.m	775	900	1030	1230	1430	1630	2150
Maximum disc speed for nominal torque *		rpm	2100	1900	1800	1500	1300	1200	900
D		mm	445	495	550	625	705	795	995
E		mm	100	120	150	185	225	265	365
F		mm	40	60	90	125	165	205	305
G		mm	285	295	305	315	330	345	380
L		mm	90	130	145	180	225	265	370
d1 min. keyed for 1 caliper (steel St 70):	**2TB**	mm	73	75	77	80	82	87	92
	3TB	mm	60	62	63	66	67	71	76
	4TB	mm	48	49	50	52	53	57	58
d1 min. keyed for 2 calipers (steel St 70):	**2TB**	mm	79	83	87	92	96	101	110
	3TB	mm	65	68	71	75	79	82	91
	4TB	mm	53	55	57	60	63	66	69
Maximum reaction on shaft ■:	**2TB**	N	18000						
	3TB	N	10000						
	4TB	N	5000						

Electric data:
- Power unit motor:
3 phases:
230/400 V ±10%, 50 Hz,
0.37 kW, 4 poles
for mains:
230/400 V 50 Hz
or 415 V 50 Hz
or 460 V 60 Hz
- Options motor:
400/690 V ±10% 50Hz
255/440 V ±10% 50Hz
290/500 V ±10% 50Hz
280/480 V ±10% 60Hz
330/575 V ±10% 60Hz
- Other voltages, consult us.
- Electrical casing IP55
- Opening switch:
240 V, 3 A, 10 VA AC
250 V, 0.3 A, 10 W DC

Service Brakes

APPLICATIONS

- PORT CRANES
- HOIST, GANTRY AND TROLLEY MOTIONS
- BELT CONVEYORS
- MINES
- IRON AND STEEL INDUSTRY
- LADLE CRANES

THRUSTOR SERVICE BRAKES

MAIN CHARACTERISTICS

- FAILSAFE BRAKES
- SPRING APPLIED
- ELECTROHYDRAULIC THRUSTOR RELEASED
- ADJUSTABLE BRAKING TORQUE

OPTIONS

- LINING FULL WEAR CONTROL SWITCH
- HIGH TEMPERATURE STEEL WORKS (SIDHT)
- HIGH TEMPERATURE THRUSTOR (HT)

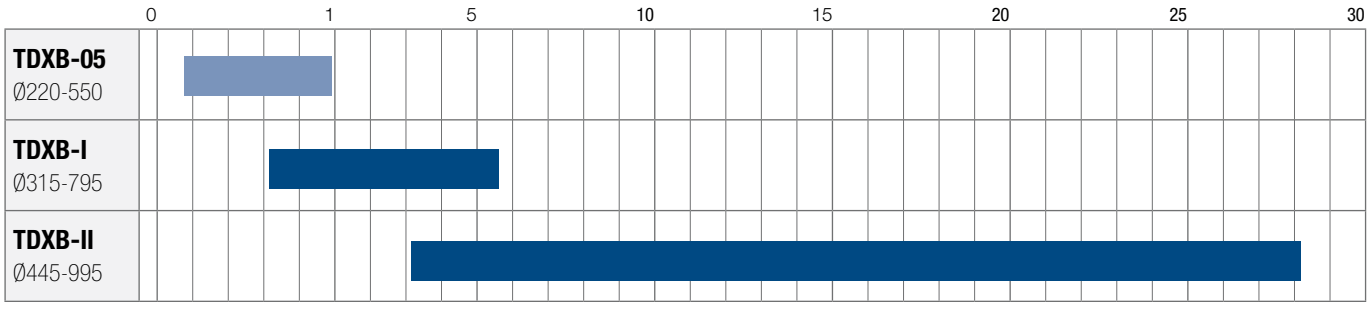
TDXB.05 - TDXB.I - TDXB.II

- Lining wear automatic compensation
- Self-centering • Manual release lever
- Opening proximity switch
- Options:
  Closing and thrustor stroke proximity switches

TDXB - SioT

- Measure of the clamping force or of the braking force
- Monitoring of the temperature
- Brake opening and closing monitoring
- Measure of the lining wear and of the opening gap

Braking Torque (kN.m)

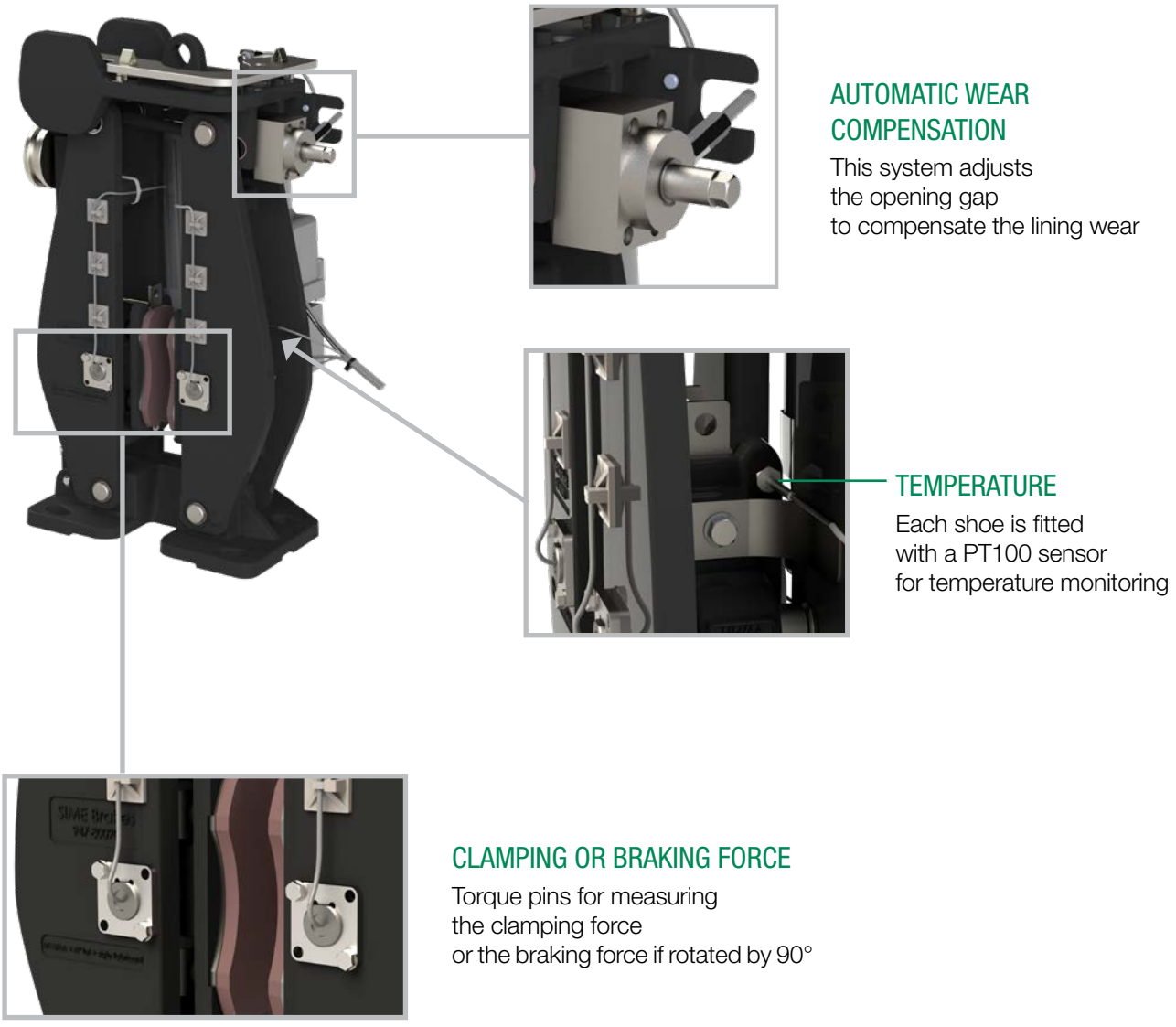


Service Brakes

DISC BRAKE - TDXB-SIOT BRAKES

SioT concept includes several modules, each having specific functions:
TDXB - SioT brakes are fitted with sensors, that enables a complete monitoring of the brake operation.

Data are processed by the Sibrake module and transmitted to the monitoring center by the Sinet module for a predictive maintenance of the installation.This reduces maintenance costs and allows a better management of the production (less downtime).



AUTOMATIC WEAR COMPENSATION

This system adjusts
the opening gap
to compensate the lining wear

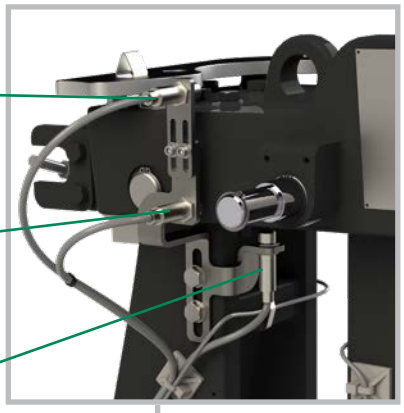
TEMPERATURE

Each shoe is fitted
with a PT100 sensor
for temperature monitoring

CLAMPING OR BRAKING FORCE

Torque pins for measuring
the clamping force
or the braking force if rotated by 90°

DISC BRAKE - TDXB-SIOT BRAKES



BRAKE OPENING

Inductive proximity switch
for brake opening monitoring

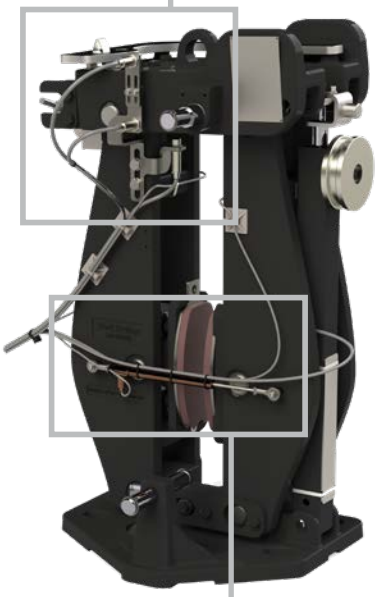
BRAKE CLOSING

Inductive proximity switch
for brake closing monitoring

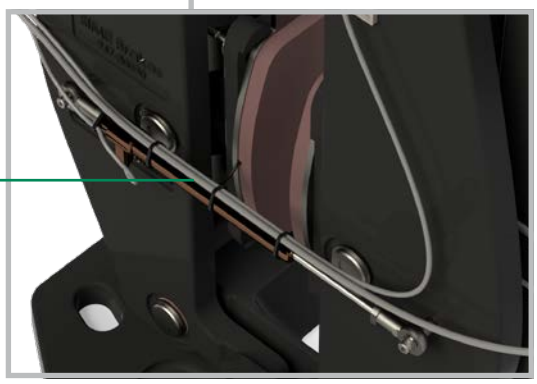
THRUSTER RESERVE STROKE

Inductive proximity switch
for thruster reserve stroke monitoring

Brake rear view



Brake rear view without the thruster



OPENING GAP / LINING WEAR

Analog linear potentiometer
for opening gap and linings wear measuring,
redundancy with opening and closing switches

Service Brakes

DISC BRAKE - TDXB-I BRAKE

Revision number: T10121-01-G **Revision date: 29.03.2021**

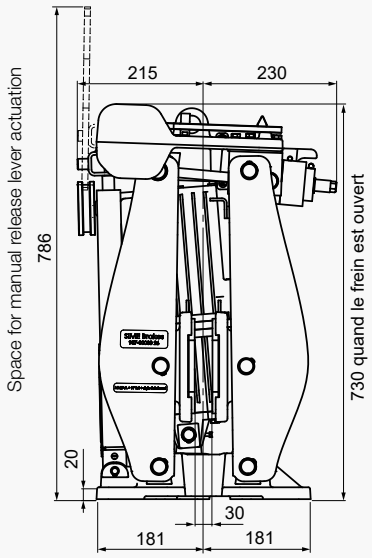
Fail safe
Spring application / Thrustor release
Self-centering
Automatic lining wear compensation
Opening sensor
Low maintenance Teflon bushes
Lining full wear indicators
Manual release lever
Lining pads with DIN shape / Thrustors **TS**

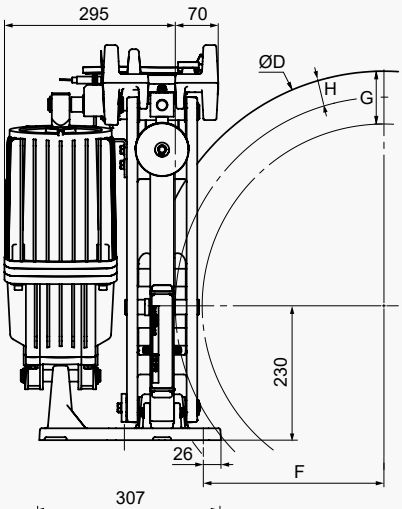
Operating conditions:
- Ambient temperature: -25°C to +50°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

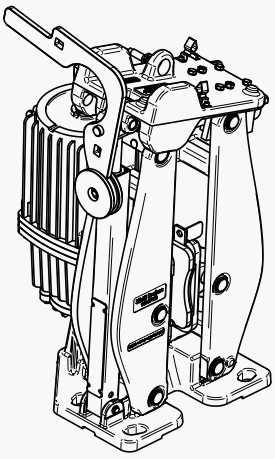
Other conditions: consult us.

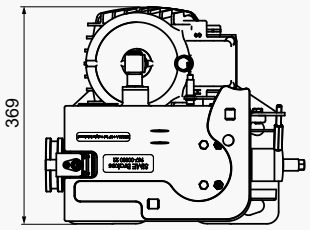
Use:
- Service brake

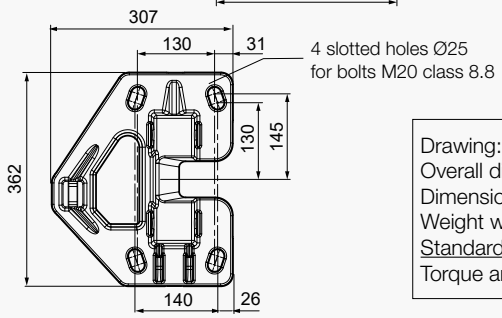
Options:
- Closing sensor
- Thrustor limit stroke sensor
- Thrustor **TS** with option:
  SW: Oil Shell HF-E-32 / High Temp. seals
  SV: Special Voltage
- Custom color
- Thrustor **VS** or **Ed**
- Inductive sensors DC-AC 24-240V 50/60 Hz











Drawing: **TDXB-I** fitted with a **TS** thrustor.
Overall dimensions are identical with **VS** or **Ed** thrustor.
Dimensions in mm
Weight without thrustor with lining pads: 85 kg
Standard: Lining quality **WS1-5**
Torque and effort values are subject to a variation of 10%.

DISCS (ØD)			315	355	395	445	495	550	625	705	795
NOMINAL TORQUE. 1 caliper ✱	**TDXB-I 1**	N.m	901	996	1104	1267	1437	1619	1877	2148	2453
	TDXB-I 2	N.m	1490	1646	1826	2094	2374	2677	3102	3550	4054
	TDXB-I 3	N.m	2075	2293	2543	2917	3307	3728	4321	4945	5647
MAXIMUM DISC SPEED for nominal torque ✱✱		rpm	3000	2700	2400	2100	1900	1800	1500	1350	1200
Maximum linear speed		m/s	50								
F		mm	57	70	80	100	125	155	190	230	275
G		mm	56	59	70						
H		mm	28	30	35						
MAXIMUM REACTION ON SHAFT	**TDXB-I 1**	N	6776								
	TDXB-I 2	N	11200								
	TDXB-I 3	N	16000								

✱ Nominal torque is adjustable from 100% to 70%
✱✱ For higher speeds, consult Stromag France

DISC BRAKE - TDXB-II BRAKE

Revision number: T10122-01-I **Revision date: 02.05.2022**

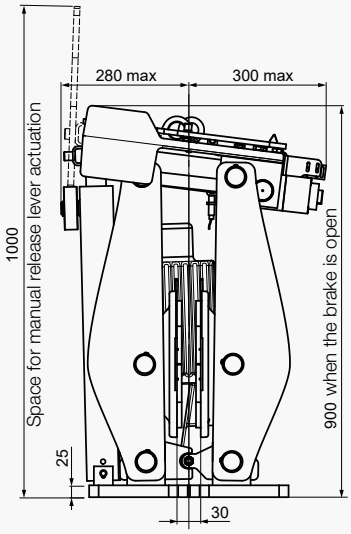
Fail safe
Spring application / Thrustor release
Self-centering
Automatic lining wear compensation
Opening sensor
Low maintenance Teflon bushes
Lining full wear indicators
Manual release lever
Thrustors **TS**

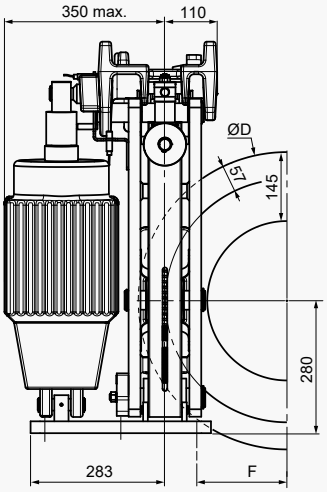
Operating conditions:
- Ambient temperature: -25°C to +50°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

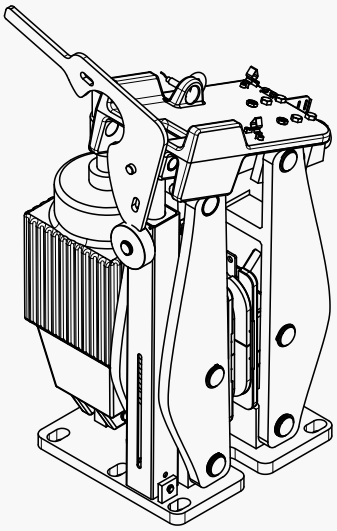
Other conditions: consult us.

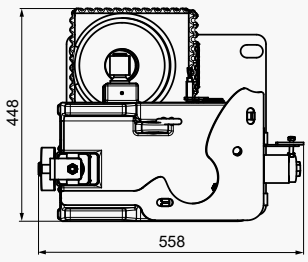
Use:
- Service brake

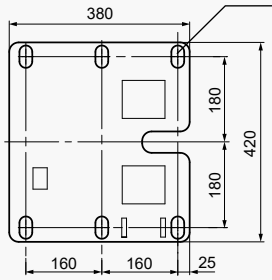
Options:
- Closing sensor
- Thrustor limit stroke sensor
- Special Voltage
- Custom color
- Thrustor **VS** or **Ed**
- Inductive sensors DC-AC 24-240V 50/60 Hz











Drawing: **TDXB-II** fitted with a **TS** thrustor.
Overall dimensions are identical with **VS** or **Ed** thrustor.
Dimensions in mm
Weight without thrustor with lining pads: 190 kg

Standard: Lining quality **WS1-5**
Torque and effort values are subject to a variation of 10%.

DISCS (ØD)			445	495	550	625	705	795	995
NOMINAL TORQUE. 1 caliper ✱	TDXB-II 1	N.m	4502	5182	5930	6950	8038	9262	11982
	TDXB-II 2	N.m	5958	6858	7848	9198	10638	12258	15858
	TDXB-II 3	N.m	7944	9144	10464	12264	14184	16344	21144
	TDXB-II 4	N.m	10592	12192	13952	16352	18912	21792	28192
MAX. DISC SPEED for nominal torque ✱✱		rpm	2100	1930	1740	1530	1354	1200	960
Maximum linear speed		m/s	50						
F		mm	93	118	145	183	255	268	368
		mm	D/2-129.5						
MAXIMUM REACTION ON SHAFT	TDXB-II 1	N	27200						
	TDXB-II 2	N	36000						
	TDXB-II 3	N	48000						
	TDXB-II 4	N	64000						

✱ Nominal torque is adjustable from 100% to 70%
✱✱ For higher speeds, consult Stromag France

Service Brakes

DISC BRAKE - TDXB-05 BRAKE soon available

Revision number: T10189-01-B **Revision date: 10.05.2022**

Fail safe
Spring application / Thrustor release
Automatic lining wear compensation
2 brake configurations depending on the requested braking torque
Braking torque adjustment device
Air gap symmetry to the disc thanks to the arms synchronization
Manual release lever and locking device
Lining type **WS1-5**
Manual release and opening sensors

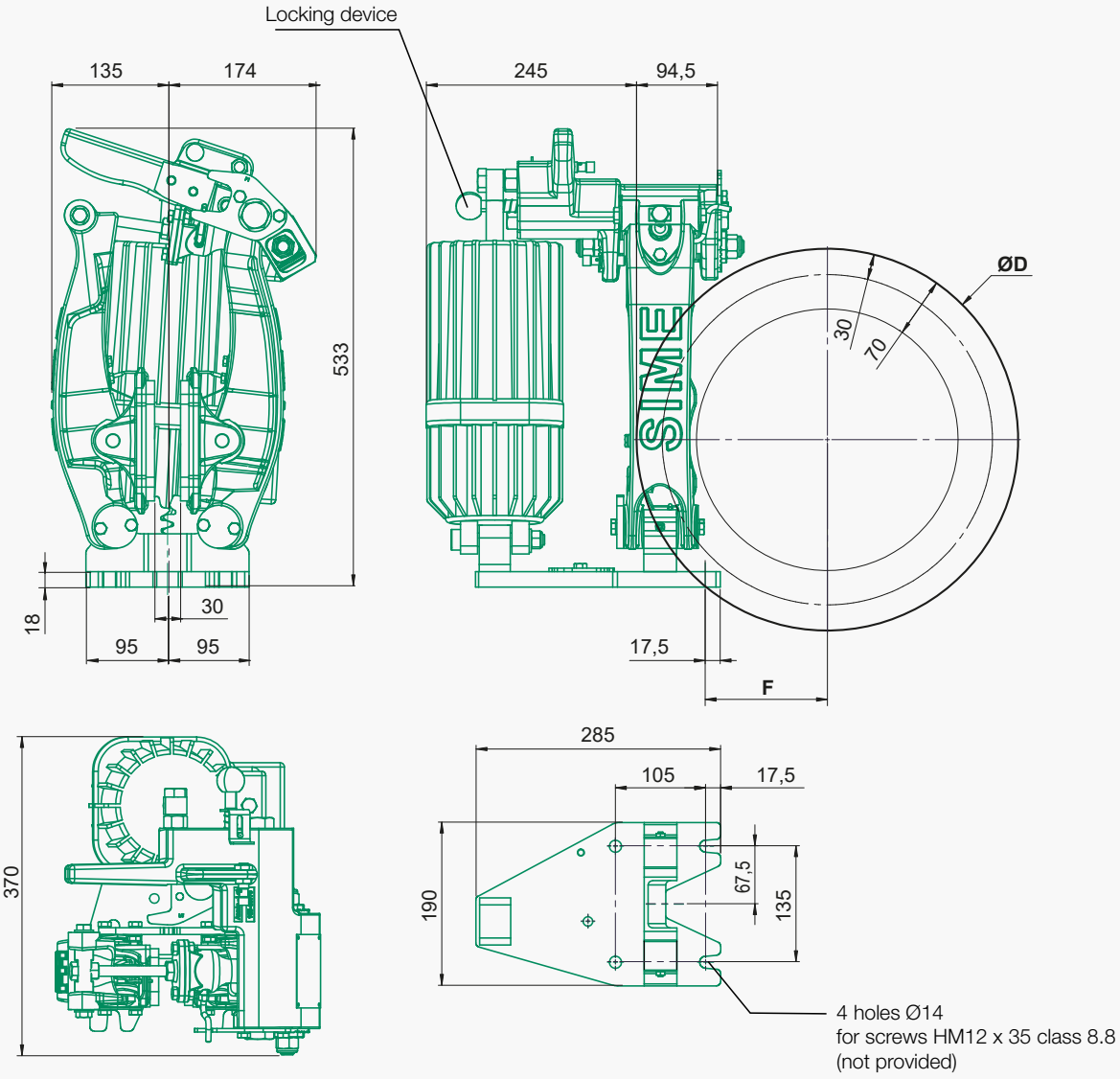
Full lining wear indicators
Thruster **TS300-50 IS** (inner spring)
P and V discs thickness 30

Use:
- Service brake
- Service life: 2 million cycles

Operating conditions:
- Ambient temperature: -25°C to +50°C peak at +70°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

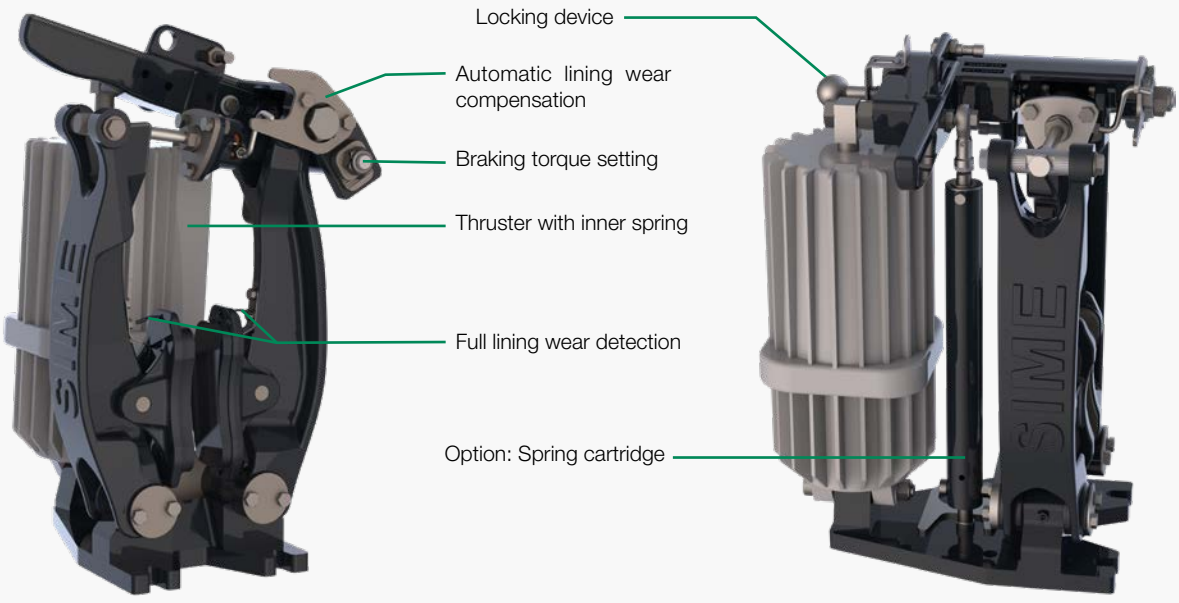
Other conditions, consult us.

Option:
- Spring cartridge
- Thruster VS or ED



DISC BRAKE - TDXB-05 BRAKE soon available

Revision number: T10189-01-B **Revision date: 10.05.2022**



Standard TDXB-05 brake with inner spring thruster
(shown in open position)

TDXB-05 brake with spring cartridge (option)
(shown in closed position)

Weight with thrustor: 46 kg
Torque and effort values are subject to a variation of ±10%

	Brake config.	Setting	DISCS (ØD)							
			220	260	315	355	395	445	495	550
NOMINAL TORQUE (N.m)	P1	**100%**	**320**	**400**	**509**	**589**	**669**	**769**	**869**	**979**
		90%	288	360	459	530	602	692	782	881
		80%	256	320	408	472	535	615	695	783
	P2	**70%**	**224**	**280**	**357**	**413**	**469**	**538**	**608**	**685**
		60%	192	240	306	354	402	462	521	587
		50%	160	200	255	295	335	385	435	490
Max. disc speed (rpm)			4300	3600	3000	2700	2400	2100	1900	1800
F = D/2 - 80 (mm)			30	50	77.5	97.5	117.5	142.5	167.5	195

Service Brakes

DISC BRAKE - FAV10-FAV15 BRAKES

Revision number: T10022-01-I **Revision date: 23.05.2013**

Fail safe
Spring application / Thrustor release
Manual centering
Lining wear compensation
Linings with wear indicator wires
Thrustor stroke control switch
Opening proving switch
Stainless steel pins
Manual release lever
Protection class C5 standard ISO12944-2

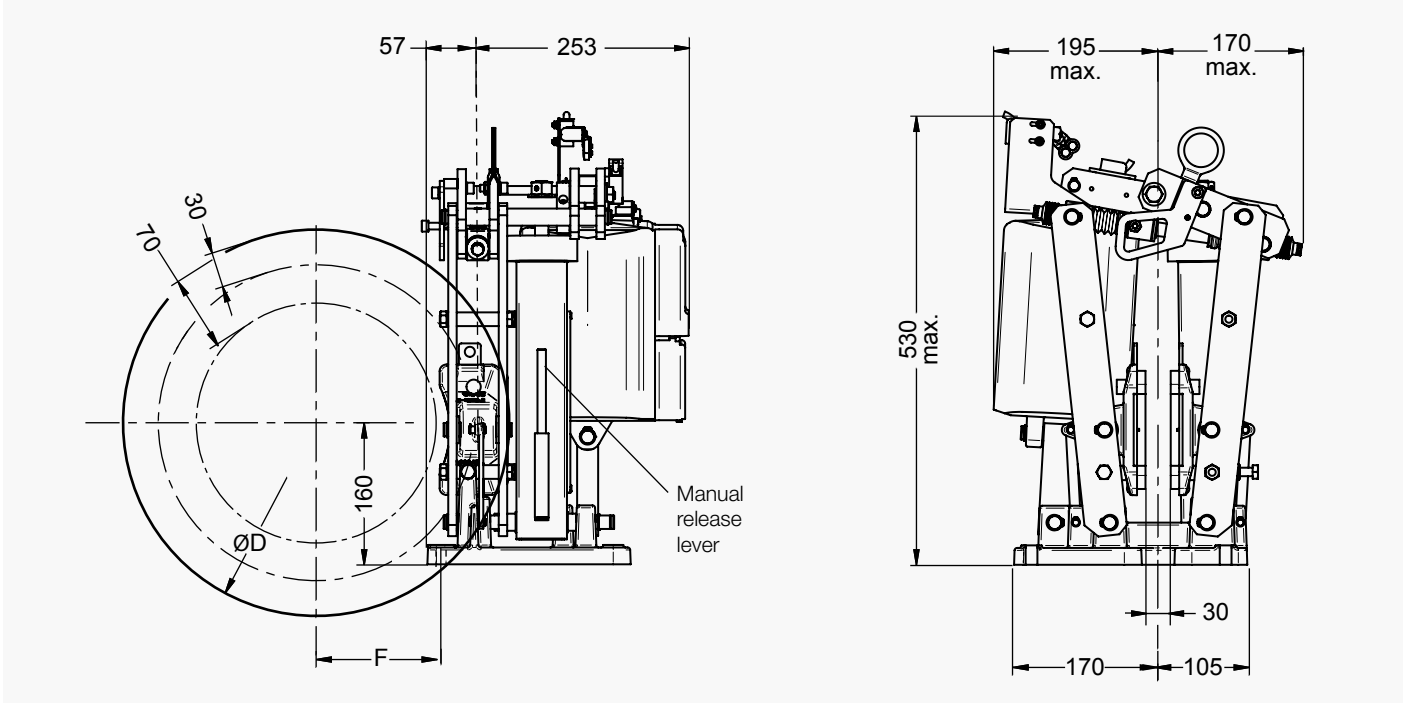
Operating conditions:
- Ambient temperature: -20°C to +50°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us.

Use:
- Service brake

Options:
- SIDHT: Steel works High Temperature
- HT: High Temperature Thrustor
- Thrustor:

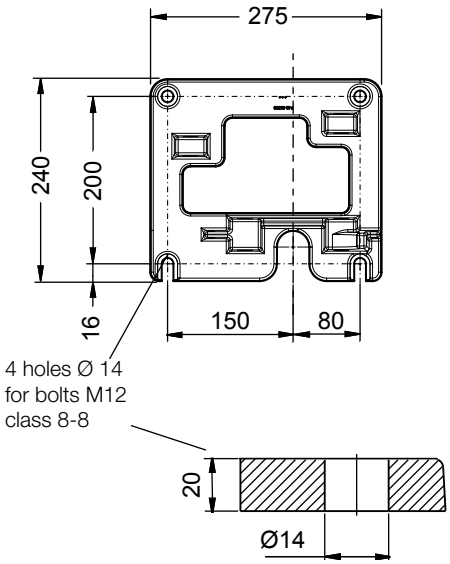
VS-I-256 or Ed23/5 - 230/400V (FAV10)
VS-I-356 or Ed30/5 - 230/400V (FAV15)



Weight without thrustor: 27 kg
Weight with thrustor: FAV10: 40 kg. FAV15: 44 kg
Torque and effort values are subject to a variation of ±10%

FAV10 and FAV15 calipers are associated with linings type **WS1-5.**

Discs (ØD)			220	260	315	355	395	445	495	550
Nominal torque. 1 caliper ✱	FAV10	N.m.	221	275	349	403	457	525	592	661
	FAV15	N.m.	265	330	410	485	550	630	710	795
Maximum disc speed for nominal torque ✱✱		rpm	4300	3600	3000	2700	2400	2100	1900	1800
F		mm	47	66	93	113	135	160	185	213
Maximum reaction on shaft	FAV10	N	2700							
	FAV15	N	3200							



✱ Braking torque is adjustable from 100% to 70% of nominal torque, friction factor µ =0.37
✱✱ For higher speeds, consult Stromag France

DISC BRAKE - FAV21 / FAV40 / FAV50 BRAKES

All technical data are available on: www.downloadstromagfrance.com

Fail safe
Spring application / Thrustor release
Auto centering
Lining wear compensation
Thrustor stroke control switch
Opening proving switch
Manual release lever
Stainless steel pins

Operating conditions:
- Ambient temperature: -20°C to +50°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us

Use:
- Service brake

Options:
- Lining full wear control switch
- MSF: Monitoring modul for FAV
- SIDHT: High Temperature Steel works
- HT: High Temperature Thrustor

FAV21-VS

Revision number: T10044-02-F **Revision date: 20.12.2019**

- Weight with thrustor and lining pads: 130 kg
- Torque and effort values are subject to a variation of ±10%
- Lining quality **WS1-5** in standard.
- Fastening: 6 holes Ø 24 for bolts M20 class 8.8
- Thrustors options: Ed50/6 - Ed80/6

✱ Nominal torque is adjustable from 100% to 70%
✱✱ For higher speeds, consult Stromag France

Discs (ØD)			355	395	445	495	550	625	705
Nominal torque ✱. 1 caliper	**FAV213 VS II 1306**	N.m.	-	-	2260	2590	2990	3450	4000
	FAV212 VS II 806	N.m.	1300	1500	1700	1950	2250	2600	-
	FAV211 VS II 506	N.m.	700	750	900	1000	1150	1350	-
Max. disc speed for nominal torque ✱✱		rpm	2700	2400	2100	1900	1800	1500	1500
F		mm	122	142	118	143	170	208	248
F		mm	(D/2-56)		(D/2-105)				
Maximum reaction on shaft	**FAV213 VS II 1306**	N	-		13600				
	FAV212 VS II 806	N	9100		10200				-
	FAV211 VS II 506	N	4500		5300				-

FAV41-VS

Revision number: T03524-02-D **Revision date: 08.11.2017**

- Weight without thrustor: 180 kg
- Weight with thrustor: 222 kg
- Torque and effort values are subject to a variation of ±10%
- The disc run-out must not exceed 0.08 % of the max radius and the disc axial displacement must be smaller than 0.5 mm.
- Lining quality **WS1-5** in standard.
- Manual release lever for FAV411/412-VS
  Manual release system for FAV413-VS
- Fastening: 6 holes Ø 28 for bolts M24 class 8.8
- Thrustors options: Ed301/10 - Ed201/10 - Ed121/10

✱ Nominal torque is adjustable from 100% to 70%
✱✱ For higher speeds, consult Stromag France

Discs (ØD)		445	495	550	625	705	795	995
Nominal torque. 1 caliper ✱ (N.m)	**FAV413 VS-III-3010**	-	-	-	9700	11200	12950	16700
	FAV412 VS-III-2010	-	4960	5650	6600	7650	8800	-
	FAV411 VS-III-1310	2650	3050	3500	4100	4750	5450	-
Maximum disc speed for nominal torque (rpm) ✱✱		2100	1900	1800	1500	1300	1200	900
F (mm) (F=D/2-130)		93	118	145	183	223	268	368
Maximum reaction on shaft (N)	**FAV413 VS-III-3010**	38000						
	FAV412 VS-III-2010	26000						
	FAV411 VS-III-1310	16000						

FAV50-VS

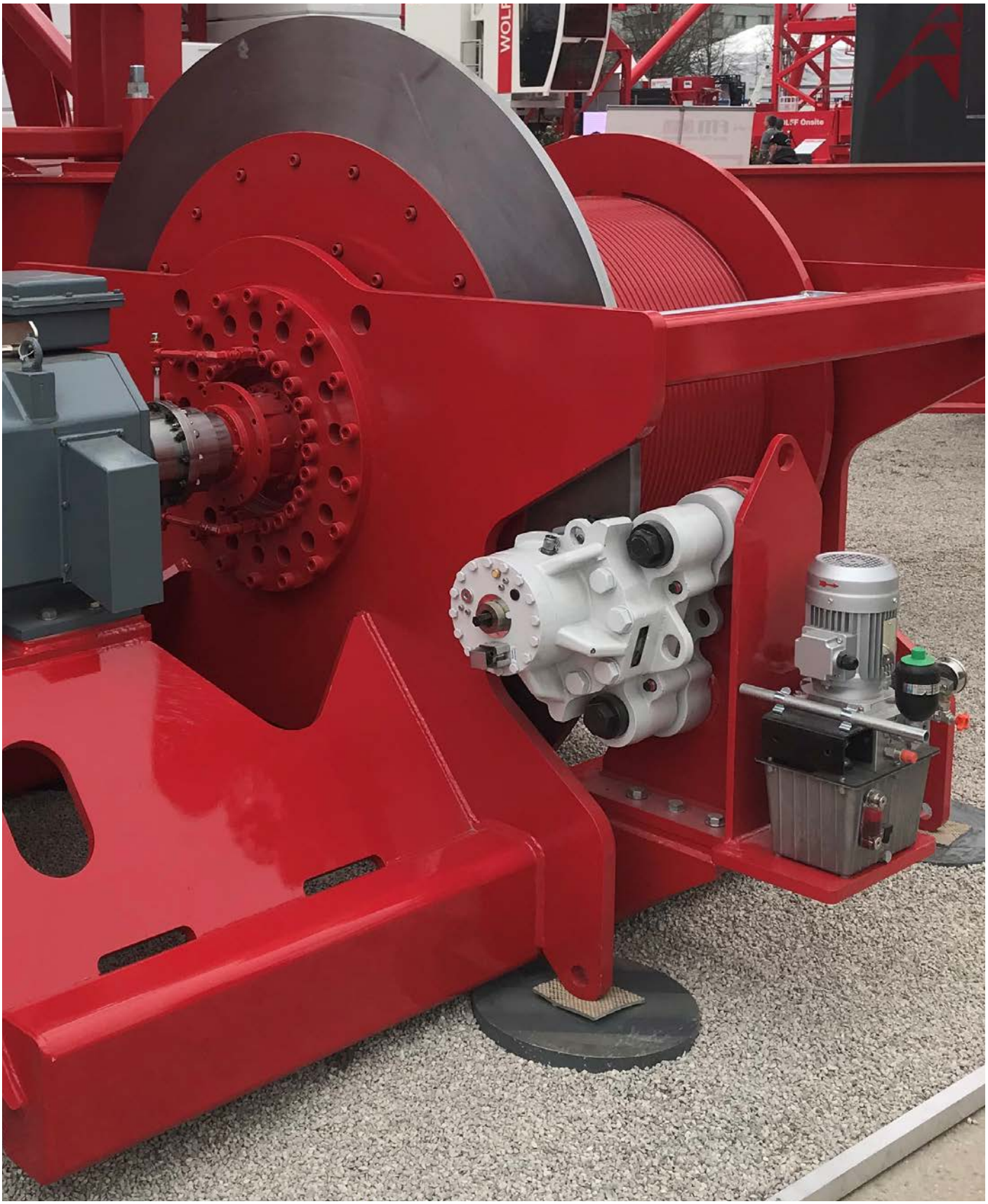
Revision number: T03525-02-E **Revision date: 08.11.2017**

- Weight without thrustor: 180 kg
- Weight with thrustor: 224 kg.
- Torque and effort values are subject to a variation of ±10%
- Lining quality **WS1-5** in standard.
- Fastening: 6 holes Ø 28 for bolts M24 class 8.8
- Thrustors option: Ed-301/100

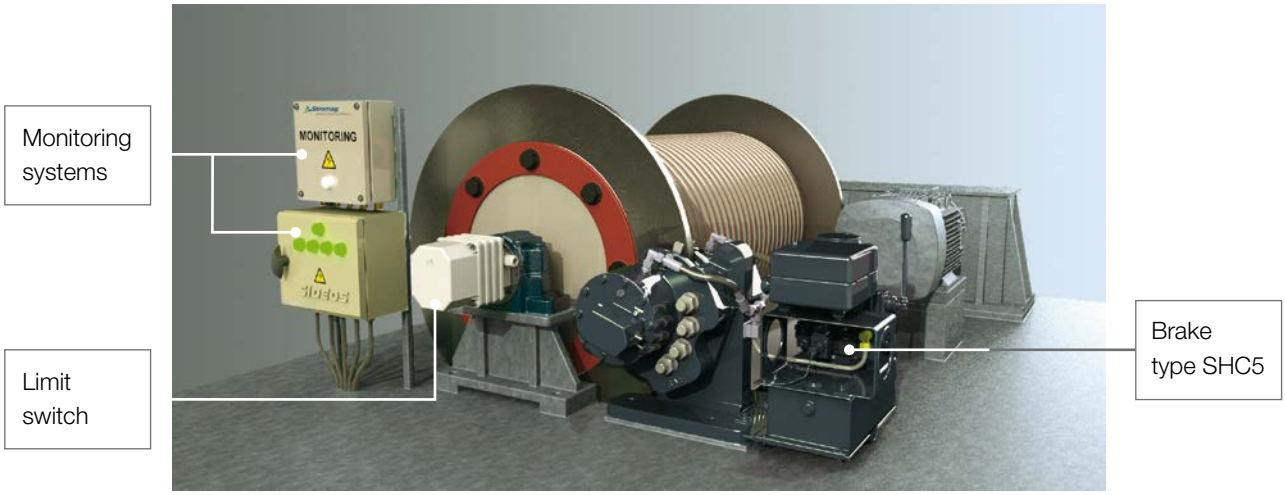
✱ Nominal torque is adjustable from 100% to 70%
✱✱ For higher speeds, consult Stromag France

Discs (ØD)		625	705	795	995
Nominal torque 1 caliper ✱ (N.m)	**FAV503-VSIII-3010**	12360	14270	16500	21270
Maximum disc speedfor nominal torque (rpm) ✱✱		1500	1300	1200	900
F (mm) (F=D/2-130)		183	223	268	368
Maximum reaction on shaft (N)		48 400			

EMERGENCY BRAKES



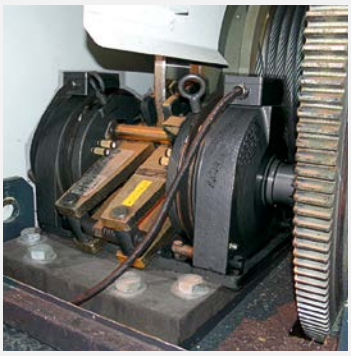
A COMPLETE BRAKING SOLUTION



Emergency Brakes

APPLICATIONS

- STEEL INDUSTRY
- NUCLEAR PLANTS



ELECTROMAGNETIC EMERGENCY BRAKES

MAIN CHARACTERISTICS	OPTIONS
• FAILSAFE BRAKE BY SPRING APPLICATION • ELECTROMAGNETIC RELEASE • MANUAL LINING WEAR COMPENSATION • OPENING PROVING SWITCH • DETECTION OF FULL LINING WEAR	• LOAD REGULATED LOWERING

2SA

Air gap switch

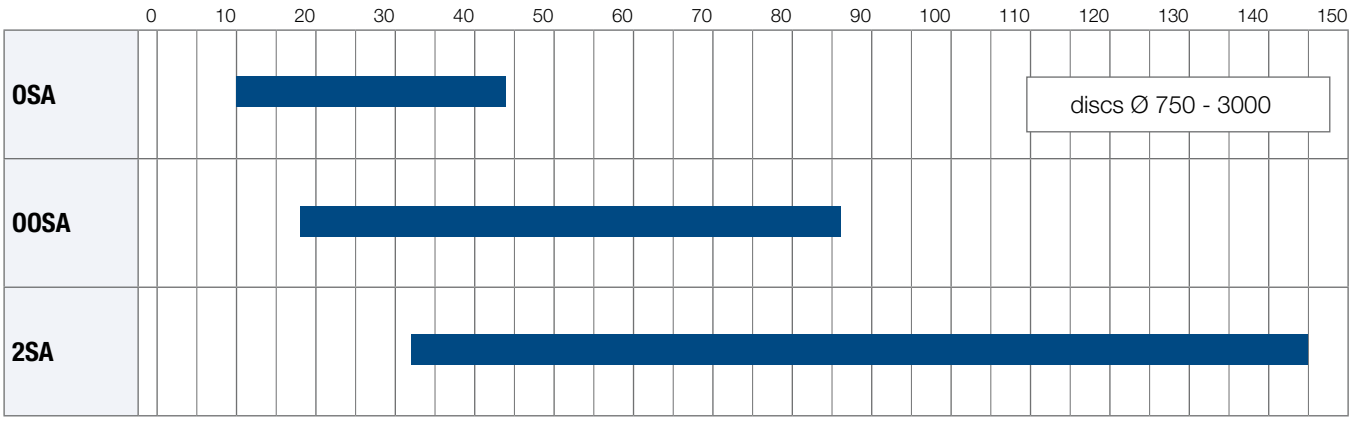
0SA

• Option:
Manual release lever
Hydraulic release
Mounting on a vertical axis disc
Flameproof / Marine protection...

00SA

• Option:
Manual release lever
Hydraulic release
Flameproof protection
Marine protection

Braking torque (kN.m)



Emergency Brakes

DISC BRAKE - OSA CALIPER

Revision number: T03750-01-F **Revision date: 22.03.2016**

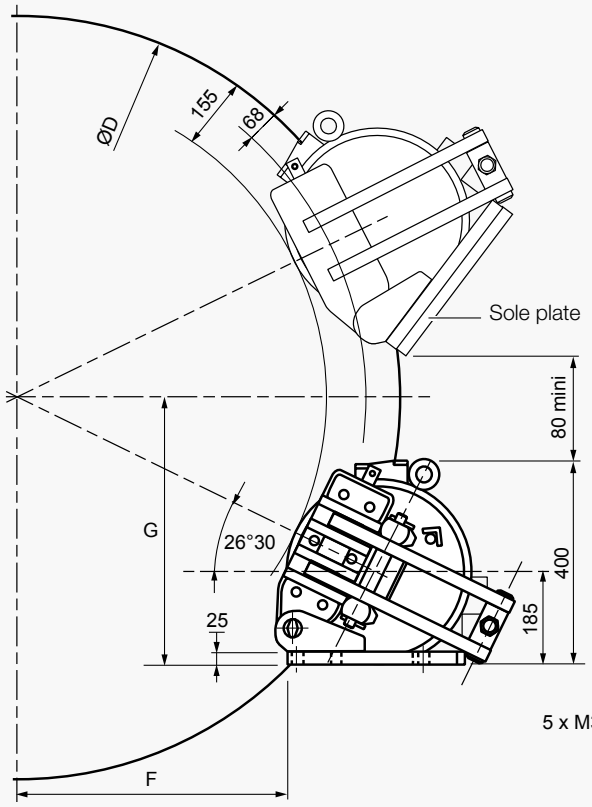
Fail safe braking
Braking by spring application
Electromagnetic release
Manual lining wear compensation
Detection of full lining wear
Opening proving switch

Operating conditions:
- Ambiant temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

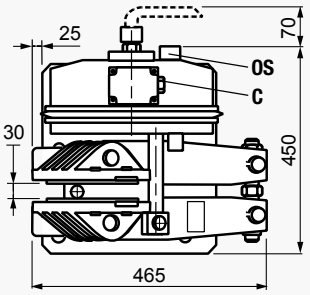
Other conditions, consult us.

Use:
The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.

Options:
- Manual release lever
- Hydraulic release
- Load regulated lowering
- Flameproof protection
- Marine protection
- Mounting on a vertical axis disc

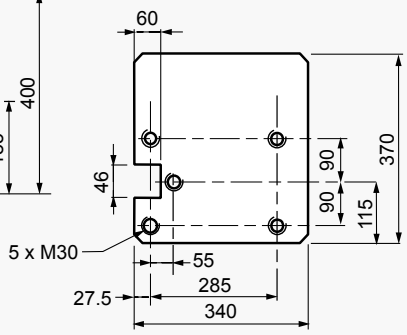


Right hand caliper



Note: the left or right hand positionning is to be precised

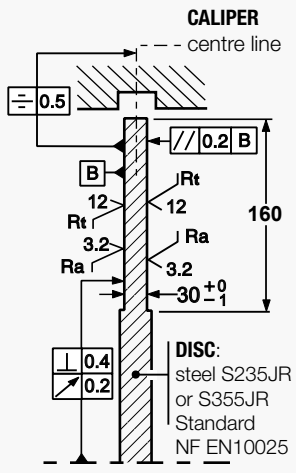
Sole plate location - top view



C = Cable gland PG16
OS = Opening switch, cable gland PG16

Weight: 200 kg
Dimensions in mm

Support and disc installation



Response time at nominal torque:
see the leaflet of the associated electrical power supply.
Force values are subject to a variation of ±10%.

Designation	Caliper		OSA
	Lining ∗		US2-1
Braking force BF	Static	N	27 900
	Dynamic	N	31 000
Linear speed of the disc		m/s	≤ 10
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD (mm)	1000 mm	N.m	13 400
	1200 mm	N.m	16 500
	1500 mm	N.m	21 100
	2000 mm	N.m	28 900
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.068)
F		mm	F = (0.4475 × ØD) - 150
G		mm	G = 196 + (0.2231 × ØD)

Opening proving switch:
250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi
220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi
Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

∗ **US2-1**: disc temperature during one braking ≤ 150°C
US2-5: disc temperature during one braking ≤ 350°C. optional. consult us.

DISC BRAKE - OOSA CALIPER

Revision number: T03770-01-E **Revision date: 22.03.2016**

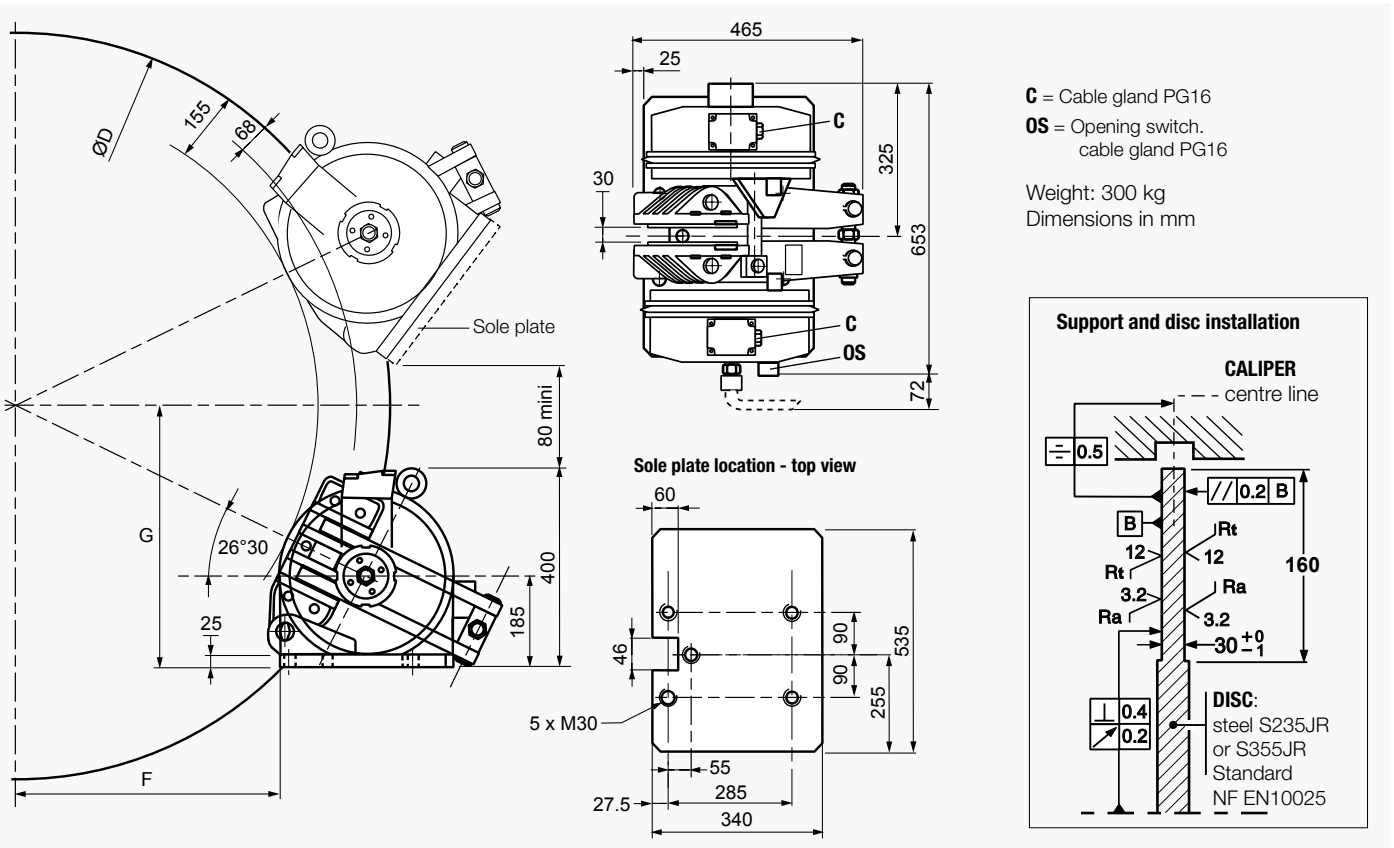
Fail safe braking
Braking by spring application
Electromagnetic release
Manual lining wear compensation
Detection of full lining wear
Opening proving switch

Operating conditions:
- Ambiant temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Use:
The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.

Options:
- Manual release lever
- Hydraulic release
- Load regulated lowering
- Flameproof protection
- Marine protection



Response time at nominal torque:
see the leaflet of the associated electrical power supply.
Force values are subject to a variation of ±10%.

Designation	Caliper		OOSA
	Lining ∗		US2-1
Braking force BF	Static Dynamic	N N	54 000 60 000
Linear speed of the disc		m/s	≤ 10
Dynamic braking torque BT (N.m) for 1 caliper and 1 disc ØD (mm)	1000 mm 1200 mm 1500 mm 2000 mm	N.m N.m N.m N.m	25 900 31 900 40 900 55 900
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.068)
F		mm	F = (0.4475 × ØD) - 150
G		mm	G = 196 + (0.2231 × ØD)

Opening proving switch:

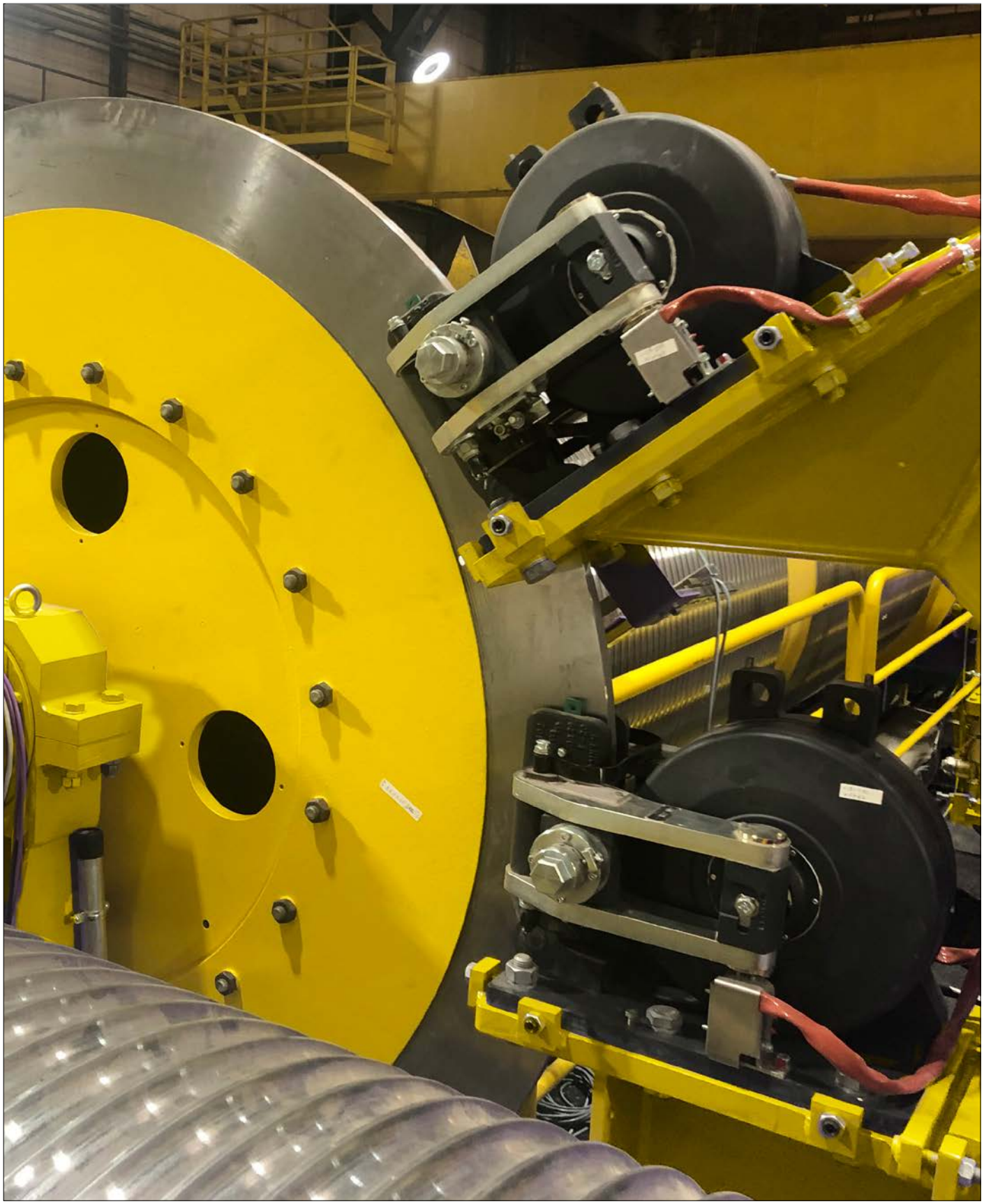
250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi

220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi

Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

∗ **US2-1**: disc temperature during one braking ≤ 150°C
US2-5: disc temperature during one braking ≤ 350°C. optional. consult us.

DISC BRAKE - 2SA CALIPER



DISC BRAKE - 2SA CALIPER

Revision number: T03781-01-D **Revision date: 22.03.2016**

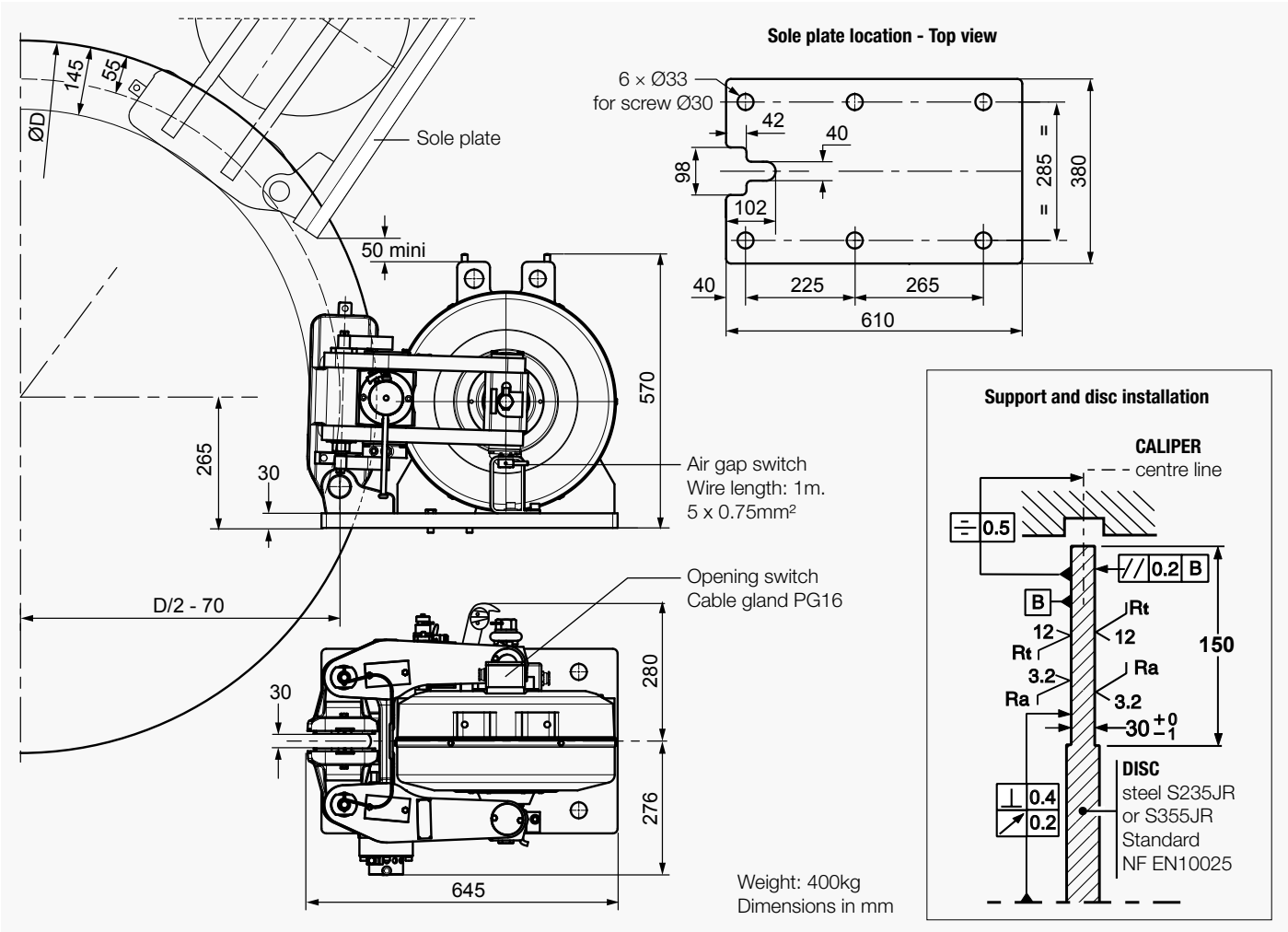
Fail safe braking
Braking by spring application
Electromagnetic release
Manual lining wear compensation
Opening proving switch
Air gap switch

Operating conditions:
- Ambiant temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Use:
The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.

Options:
- Detection of full lining wear
- Load regulated lowering



Torque and force values are subject to a variation of ±10%
Response time at nominal torque:
see the leaflet of the associated electrical power supply.

Designation	Caliper	2SA	
	Lining ∗	US2-1	US2-5
Braking force BF for 1mm of air gap disc/lining	Static N	90 000	84 600
	Dynamic N	100 000	94 000
Linear speed of the disc	m/s	≤ 10	≤ 10
Dynamic braking torque BT for 1 caliper and disc ØD (mm)	N.m	BT = BF(D/2000 - 0.055)	

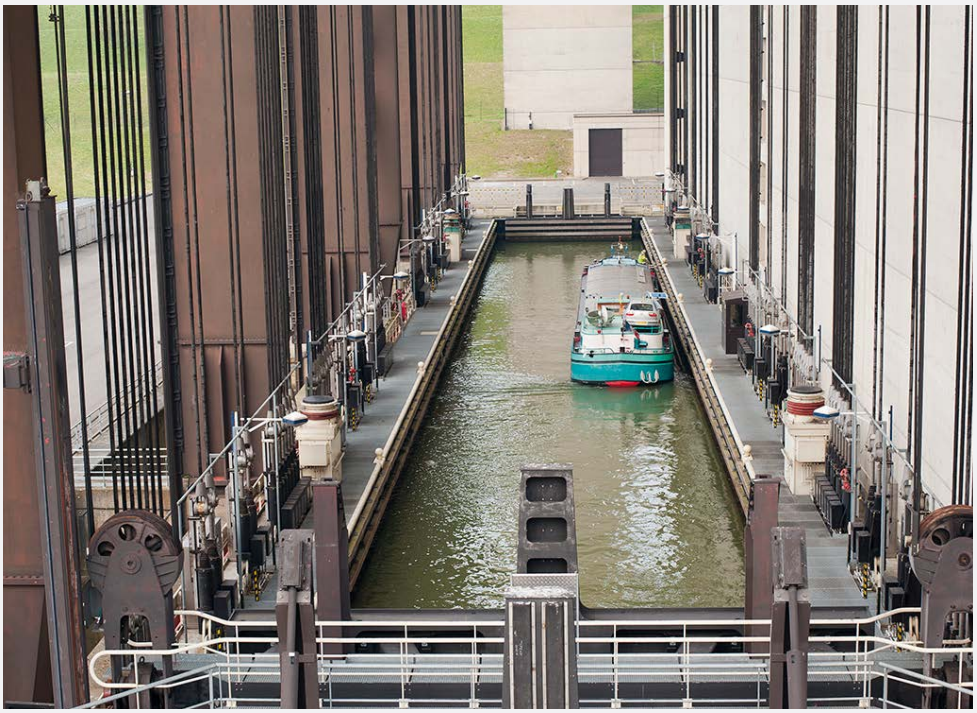
- **Opening proving switch**:
  250VAC maxi., 5A maxi., with interrupting capacity: 50VA maxi
  220VDC maxi., 5A maxi., with interrupting capacity: 50W maxi
  Compatible with PLC (Programmable Logic Controllers).
  An opening switch used with other equipment than PLC must not be reused with a PLC.
- **Air gap switch**:
  240V. 3A AC
  250V. 0.27A DC

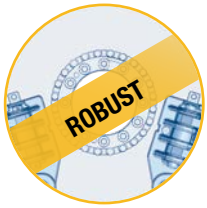
∗ **US2-1**: disc temperature during one braking ≤ 150°C
US2-5: tdisc temperature during one braking ≤ 350°C

Emergency Brakes

APPLICATIONS

- STEEL CRANES
- PORT CRANES
- NUCLEAR CRANES
- OFFSHORE APPLICATIONS
- BOATLIFTS
- MINES AND CONVEYORS





HYDRAULIC EMERGENCY BRAKES TYPE SH

MAIN CHARACTERISTICS

- FAILSAFE BRAKE BY SPRING APPLICATION
- HYDRAULIC RELEASE
- OPENING PROVING SWITCH
- LINING WEAR INDICATORS

OPTIONS

- LINING WEAR PROVING SWITCH
- PROGRESSIVE BRAKING SYSTEM
- OFFSHORE PROTECTION
- LINING TEMPERATURE SENSOR
- HIGH TEMPERATURE, IRON AND STEEL CONDITIONS

SH

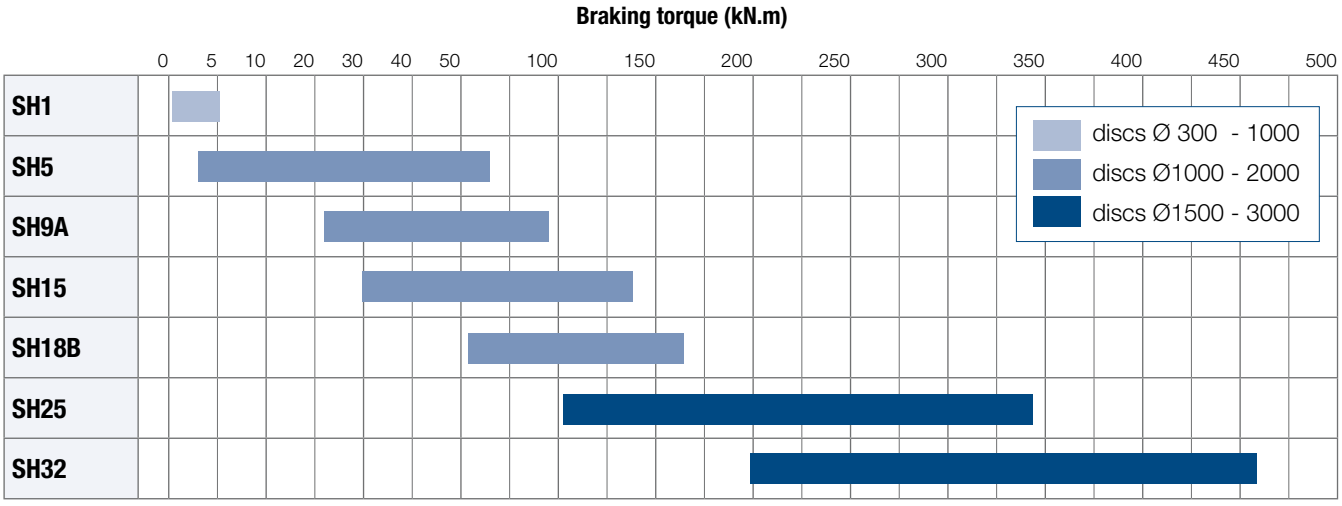
- Association with disc thicknesses: depending on the type of caliper: 12.7 - 15 - 20 - 30 or 42 mm.

SHS

- Caliper mounted on a support
- Tailor-made solutions for any installation : banana supports

SHC

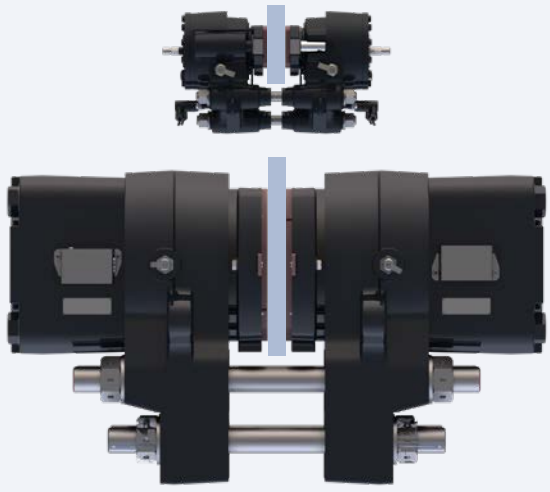
- Caliper and Hydraulic Power Pack mounted on the same support
- Option: Electrical unit



Emergency Brakes

DISC BRAKE - SH - SHS - SHC - SHD CALIPERS

The calipers **SH** are powerful hydraulic brakes with a symmetrical design, they are specially designed to operate in severe conditions.
The calipers **SHD** are mono-spring and are particulary adapted for applications with reduced space.



SH1 to SH32

2 half-calipers / Double piston

SHD1 to SHD18

1 half-caliper / Mono spring

SHS9A caliper

SHS and SHDS

Caliper mounted on a support

SH32 calipers

SHS and SHDS

2 or more calipers on a tailor-made support

DISC BRAKE - SH - SHS - SHC - SHD CALIPERS

The hydraulic calipers **SH** and **SHD** can be delivered mounted on a support, with or without:
Hydraulic Power Pack, jonction box, electrical control unit, SIMAN intelligent management system.
Several calipers can be mounted on the same tailor-made support.
Floating calipers **SHF** and **SHDF** are tailor-made according to the customer's installation, contact us.

Caliper with Hydraulic Power Pack mounted on the same support

	SHPU1
SHC5	Tank 5L, 0.37kW
SHC9A	Tank 5L, 0.75kW
SHC15/18B	Tank 5L, 2.2kW
SHC25	
SHC32	

	SHPU2
SHC5	Tank 8L, 2.2kW
SHC9A	
SHC15/18B	Tank 11L, 2.2kW
SHC25	
SHC32	

	SHPU3 MOPS - SB
SHC5	Tank 8L, 2.2kW
SHC9A	
SHC15/18B	
SHC25	
SHC32	

See SHPU data sheets

SHCxx-SHPU1	K-BA	Basic electrical unit
	K-TB	Terminal Box

SHCxx-SHPU2	K-BA	Basic electrical unit
	K-TB	Terminal Box
	K-PR	Premium Electrical unit
	K-SI	Electrical unit with SIMAN for control, monitoring and safety functions

For SHCxx- SHPU3 with electrical unit, consult us.

Emergency Brakes

DISC BRAKE - SH1 CALIPER

Revision number: T10097-01-I **Revision date: 15.09.2021**

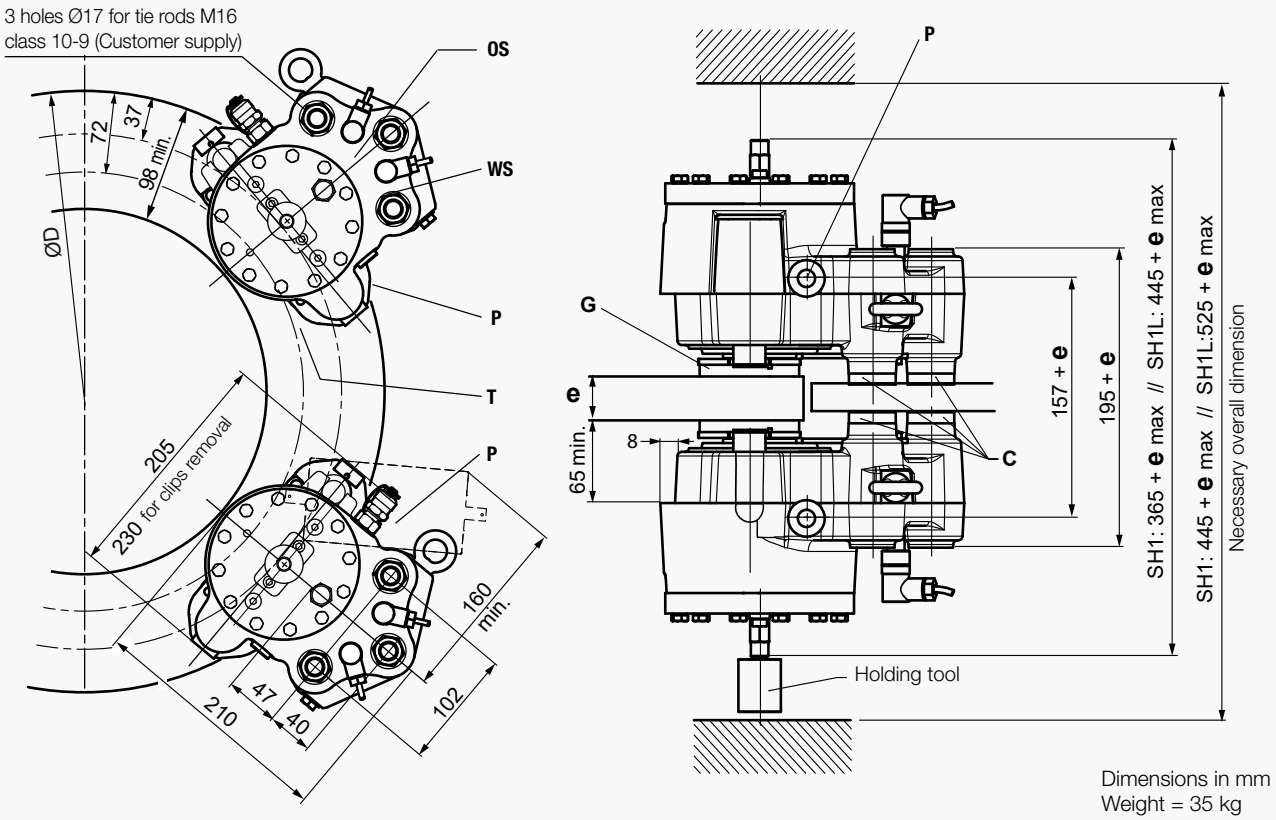
Emergency brake
Fail to safe
Spring application
Hydraulic release
Linings with wear indicators
Holding tool for maintenance operation
Manual wear centering and compensation
Association with discs thickness:
12.7 (1/2"), 15, 20 and 30mm.
Lining pads type **US2-1** or **ES3-7**
Lining pads with full wear indicators
Protection C5-M M

Operating conditions:
- Ambient temperature:
  Dynamic braking: -30°C to +70°C
  Brake applied (parking): -40°C to +70°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µm

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains.
  Other use, consult us.

Options:
- Opening proving switch (**OS**)
- Lining wear proving switch (**WS**)
- All non-standard disc thickness > 12.7mm (1/2")
- Lining temperature sensor (**T**)
- Mechanical release tool (**DM**)
- **SH1L**: caliper requiring no manual wear compensation:
  - braking force before lining wear = +10% maxi.
  - braking force after lining wear = -10% maxi.



Dimensions in mm
Weight = 35 kg

Electrical data:

Inductive switches of opening and wear (options):
3 wires PNP NO
12 to 24 VDC 200mA
with male connector M12 / 5 positions
according to standard IEC61076-2-101 / code A

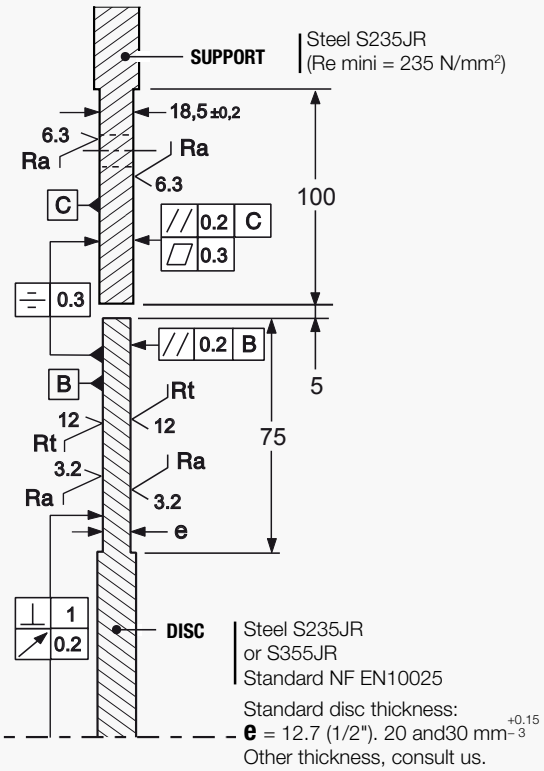
Sensor PT100 (option)
Detection of the temperature
threshold: 100°C ± 5
Cable length = 2.5 meters
2 wires red/yellow

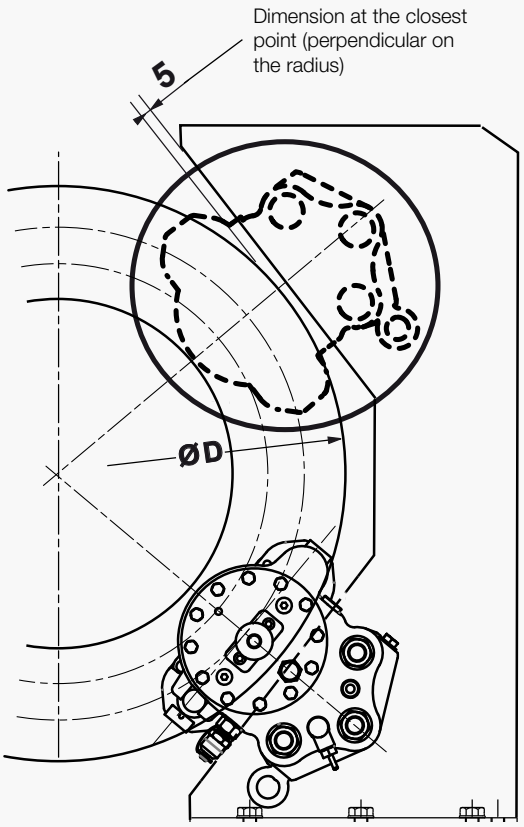
C = Spacers according to disc thickness
G = Linings: Thickness of new lining 8 mm
Thickness to wear 6 mm
Each 1mm of wear on each side: manual centering and compensation
OS = Opening switch (option)
WS = Lining wear switch (option)
P = 2 oil ports 1/4"G per half-caliper
Pressure taps delivered separately
T = PT100 sensors (option)
ØD = Disc diameter = 300 mm minimum
e = Disc thickness

DISC BRAKE - SH1 CALIPER

Revision number: T10097-01-I **Revision date: 15.09.2021**

Disc and support:





Torque and effort values are subject to a variation of ±10% - Closing time at nominal torque ≤ 0.3s

Designation	Caliper SH1-		5	4	3	2	1	5	4	3	2	1
	Lining ∗		US2-1					ES3-7				
Braking force BF for air gap disc/lining of 2x1mm	**Dynamic**	N	11 000	8 000	6 000	4 000	3 000	11 000	8 000	6 000	4 000	2 000
	Static	N	9 680	7 040	5 280	3 520	2 640	9 900	7 200	5 400	3 600	1 800
Linear speed of the disc ●		m/s	≤ 10					≤ 50				
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / 300 ≤ D ≤ 1000 mm		N.m	BT = BF (D/2000-0.037)									
Regulation pressure	Minimum Maximum	bar bar	150 170									
Setting pressure limit valve of hydraulic unit		bar	190									
Total volume of oil displaced for air gap disc/lining of:	2 x 1mm (nominal opening)	cm^3	5 cm^3									
	2 x 3mm (wear+opening)	cm^3	13 cm^3									
	2 x 7mm **SH1L** (wear+open.)	cm^3	29 cm^3									

∗ **ES3-7**: disc temperature during one braking ≤ 600°C
US2-1: disc temperature during one braking ≤ 100°C

● For higher speed, consult us.

Emergency Brakes

DISC BRAKE - SH5 CALIPER

Revision number: T03865-02-C **Revision date: 23.09.2010**

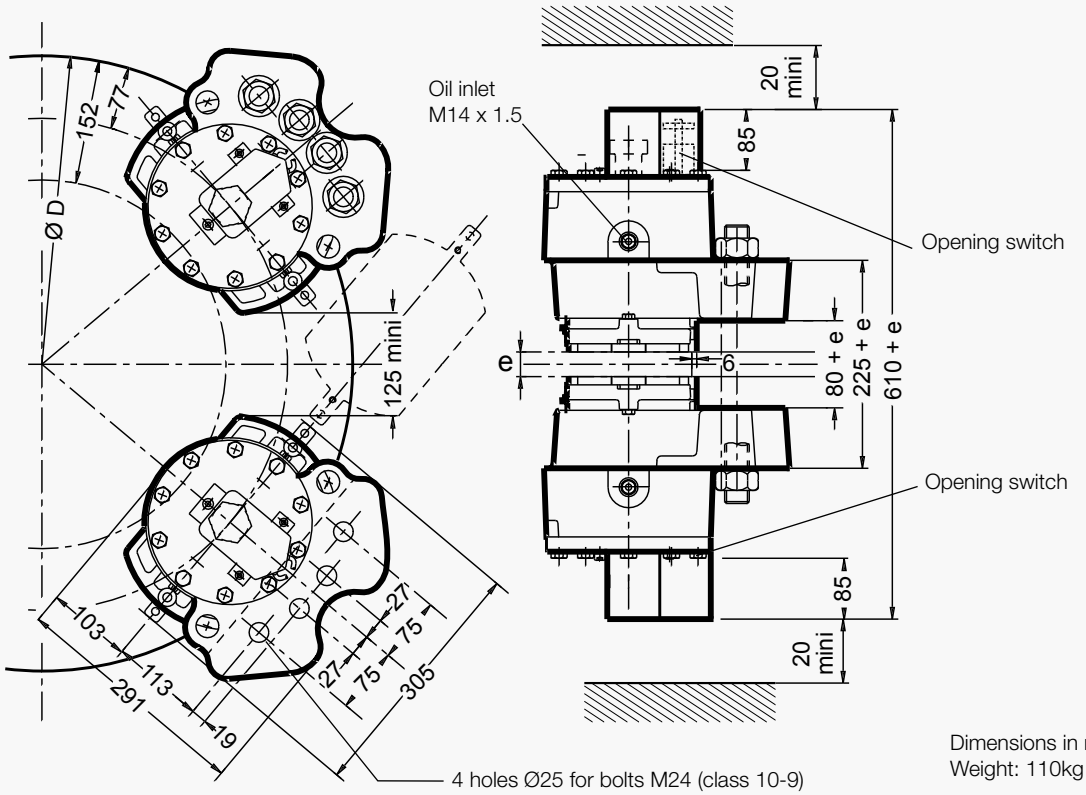
Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear detector

Operating conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:
- Automatic lining wear compensation (WACS)
- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power unit



Dimensions in mm
Weight: 110kg

Opening proving switch:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

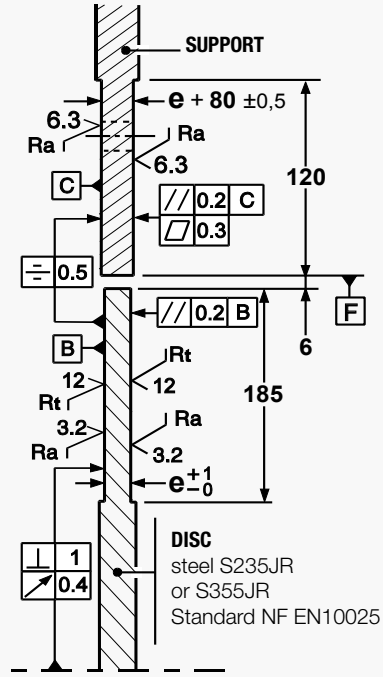
220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

Compatible with PLC
(Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

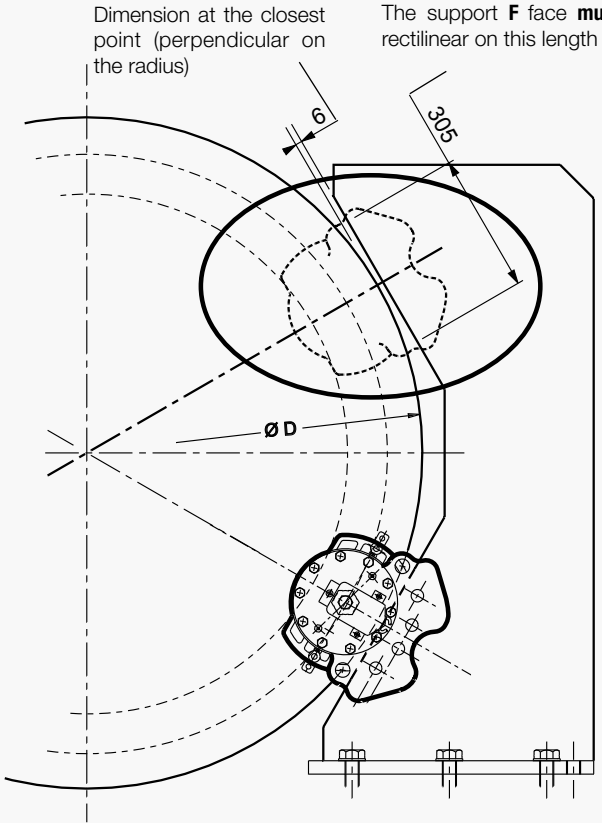
DISC BRAKE - SH5 CALIPER

Revision number: T03865-02-C **Revision date: 23.09.2010**

Disc and support:



Standard disc thickness: 30 ≤ e ≤ 50 mm.
Other thickness, consult us. Dimensions in millimetre



Torque and effort values are subject to a variation of ±10%

Response time at nominal torque: see the leaflet n° G08555-01

Désignation	caliper		SH5-6		SH5-5		SH5-4		SH5-3		SH5-2	
	Lining ✳		US2-1	WS1-3	US2-1	WS1-3	US2-1	WS1-3	US2-1	WS1-3	US2-1	WS1-3
Braking force BF for 1mm of air gap disc/lining	Static	N	63 000	43 200	51 300	35 100	37 800	25 900	21 200	14 500	9 600	6 500
	Dynamic	N	70 000	48 000	57 000	39 100	42 000	28 800	23 600	16 200	10 700	7 300
Linear speed of the disc		m/s	≤ 10	≤ 50	≤ 10	≤ 50	≤ 10	≤ 50	≤ 10	≤ 50	≤ 10	≤ 50
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD (mm)	995 mm	N.m	29430	20 180	23 960	16 440	17 660	12 110	9 920	6 810	4 490	3 070
	1200 mm	N.m	36610	25 100	29 810	20 440	21 960	15 060	12 340	8 470	5 590	3 810
	1500 mm	N.m	47110	32 300	38 360	26 310	28 260	19 380	15 880	10 900	7 200	4 910
	2000 mm	N.m	64610	44 300	52 610	36 080	38 760	26 580	21 780	14 950	9 870	6 730
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.077)									
Regulation pressure	minimum	bar	180		140		110		85		40	
	maximum	bar	200		160		140		115		60	
Setting pressure of the limit valve of hydraulic power unit		bar	210		190		165		140		80	
Total volume of oil displaced		cm^3	35 for one stroke disc/lining (nominal wear and opening)									

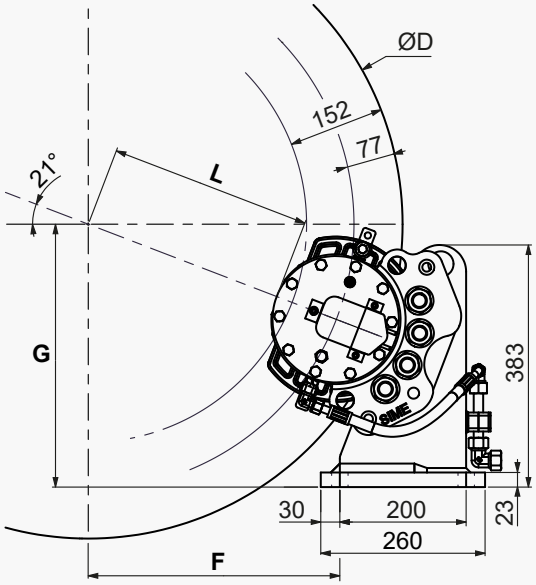
✳ **US2-1**: disc temperature during one braking ≤ 150°C
WS1-3: disc temperature during one braking ≤ 600°C
US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

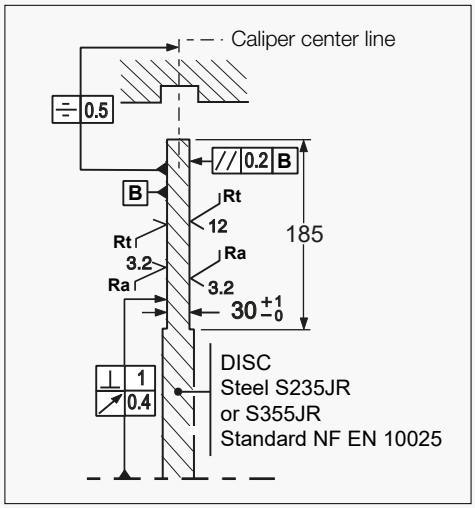
Emergency Brakes

DISC BRAKE - SHS5 CALIPER

Revision number: T10191-01-A **Revision date: 30.11.2021**

- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switches
- Lining wear indicator wires
- See technical data in SH5 leaflet
- Weight = 130 kg

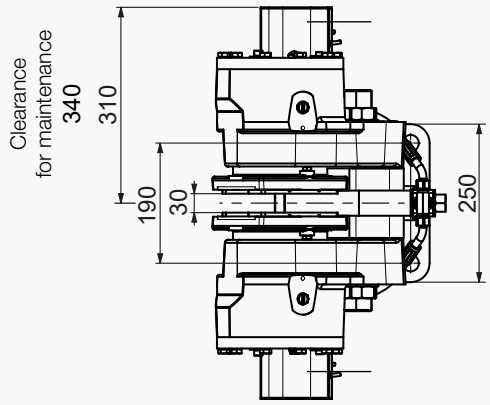


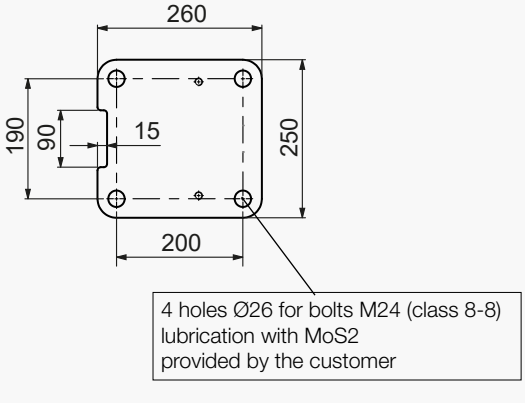


$$F = \frac{D}{2} \times \cos(21°) - 66.34$$

$$G = \frac{D}{2} \times \sin(21°) + 237.56$$

$$L = \frac{D}{2} - 181$$

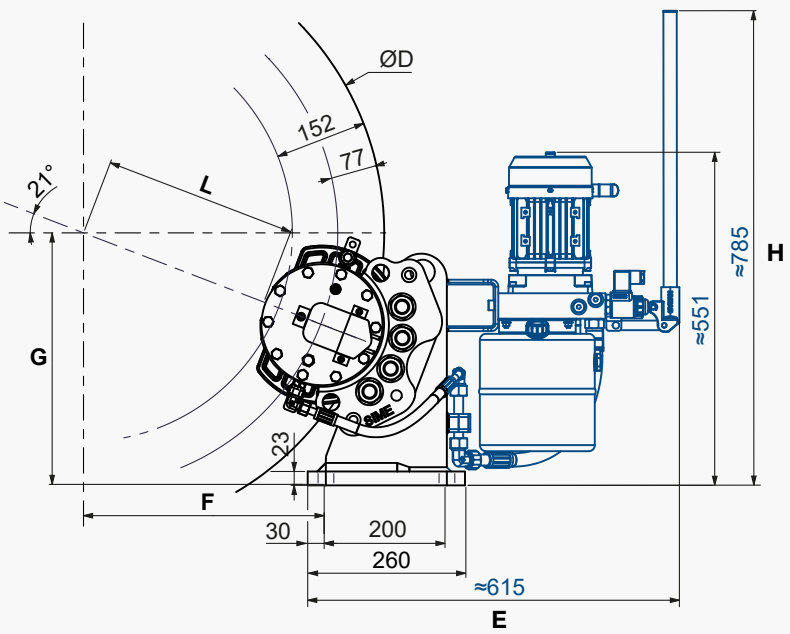


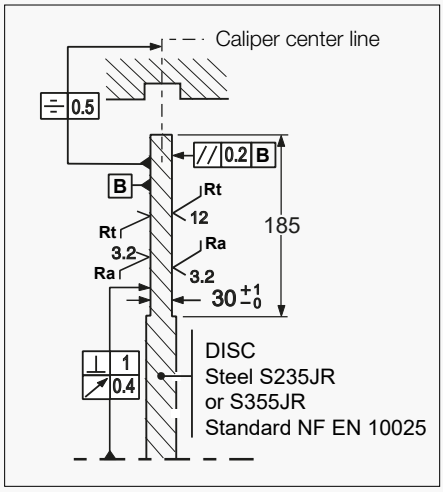


DISC BRAKE - SHC5-SHPU1 CALIPER

Revision number: T10191-01-A **Revision date: 30.11.2021**

- Caliper mounted on a support
- SHPU1 (motor 0,37 kW) HPP connected to the caliper
- Opening switches
- Lining wear indicator wires
- See technical data in SH5 leaflet
- Weight = 152 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **E**≈615, **H**≈785, **P**≈242
  K-PR: **E**≈615, **H**≈785, **P**≈232
  K-SI: **E**≈697, **H**≈785, **P**≈315

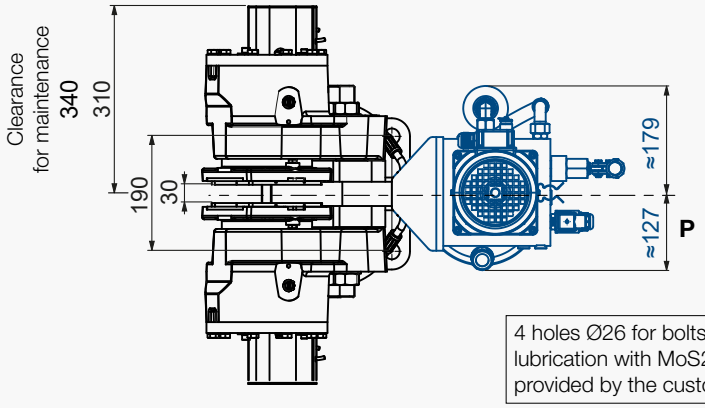


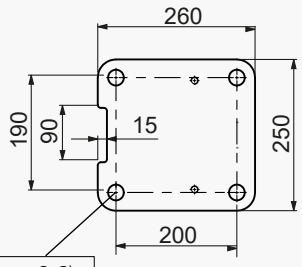


$$F = \frac{D}{2} \times \cos(21°) - 66.34$$

$$G = \frac{D}{2} \times \sin(21°) + 237.56$$

$$L = \frac{D}{2} - 181$$





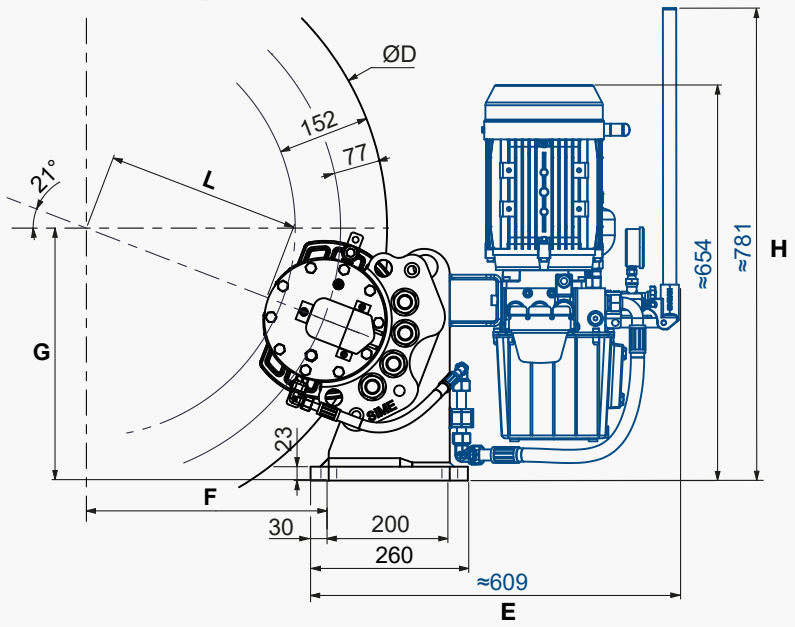
4 holes Ø26 for bolts M24 (class 8-8)
lubrication with MoS2
provided by the customer

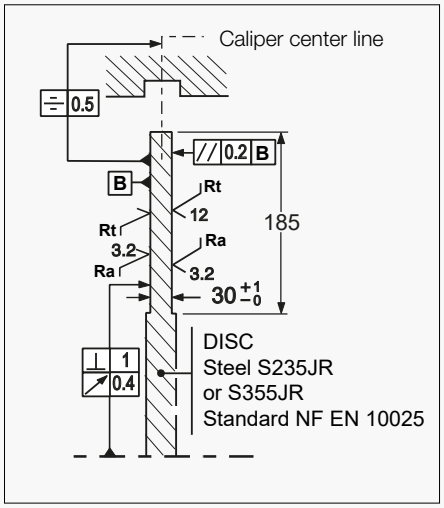
Emergency Brakes

DISC BRAKE - SHC5-SHPU2 CALIPER

Revision number: T10191-01-A **Revision date: 30.11.2021**

- Caliper mounted on a support
- SHPU2 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear indicator wires
- See technical data in SH5 leaflet
- Weight = 152 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **E**≈609, **H**≈781, **P**≈294
  K-PR: **E**≈609, **H**≈781, **P**≈284
  K-SI: **E**≈682, **H**≈781, **P**≈367

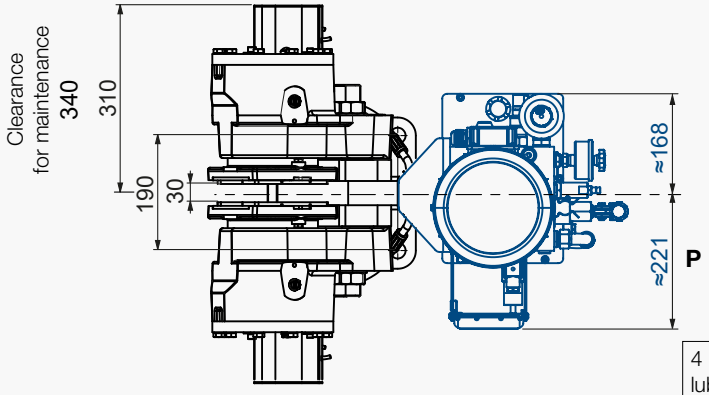


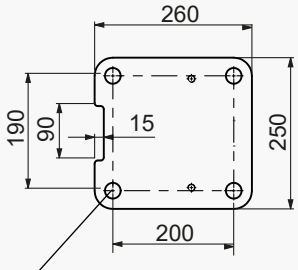


$$F = \frac{D}{2} \times \cos(21°) - 66.34$$

$$G = \frac{D}{2} \times \sin(21°) + 237.56$$

$$L = \frac{D}{2} - 181$$



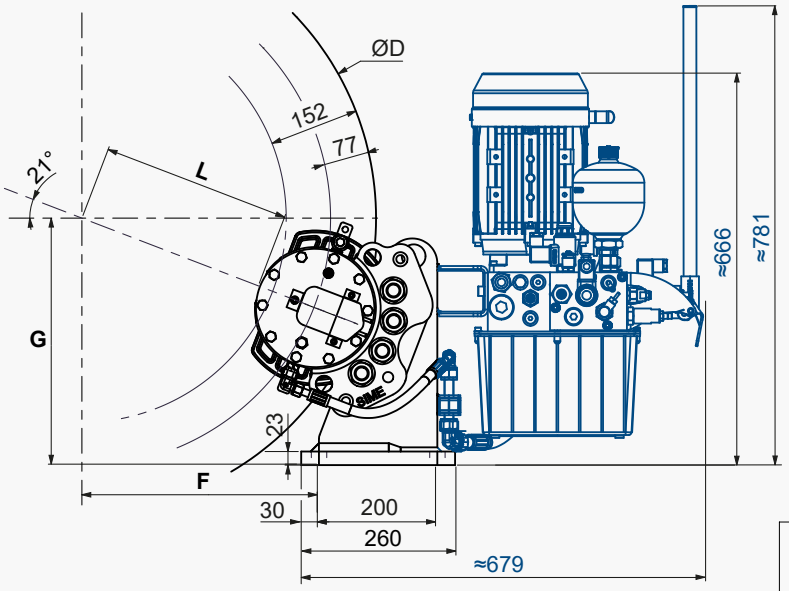


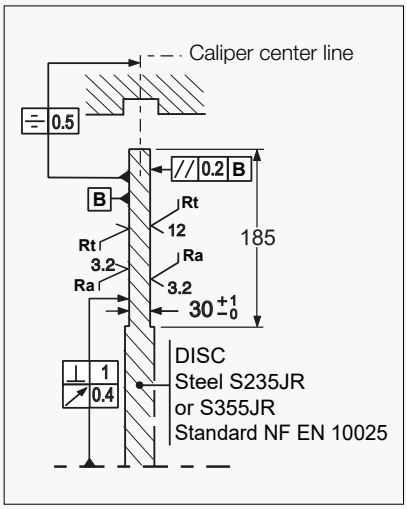
4 holes Ø26 for bolts M24 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHC5-SHPU3 CALIPER

Revision number: T10191-01-A **Revision date: 30.11.2021**

- Caliper mounted on a support
- SHPU3 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear indicator wires
- Weight = 193 kg
- Electrical unit: consult us
- See technical data in SH5 leaflet

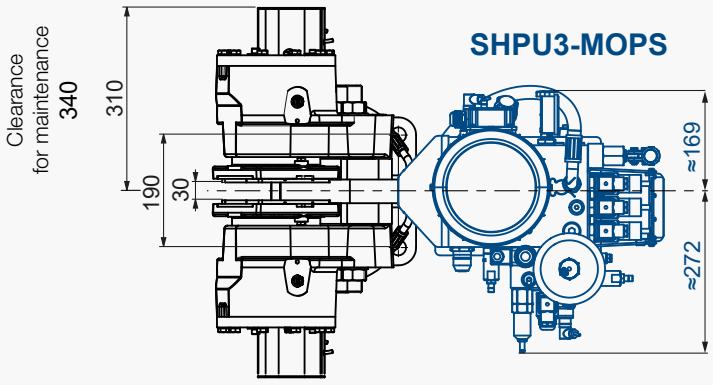


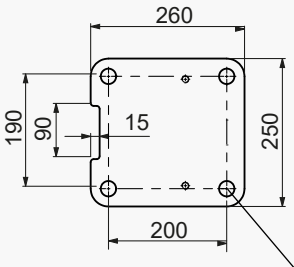


$F = \frac{D}{2} \times \cos(21°) - 66.34$

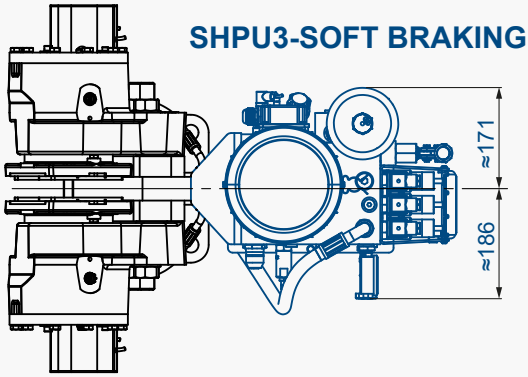
$G = \frac{D}{2} \times \sin(21°) + 237.56$

$L = \frac{D}{2} - 181$





4 holes Ø26 for bolts M24 (class 8-8)
lubrication with MoS2
provided by the customer



Emergency Brakes

DISC BRAKE - SH9A CALIPER

Revision number: T10077-01-B **Revision date: 30.05.2013**

Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches.

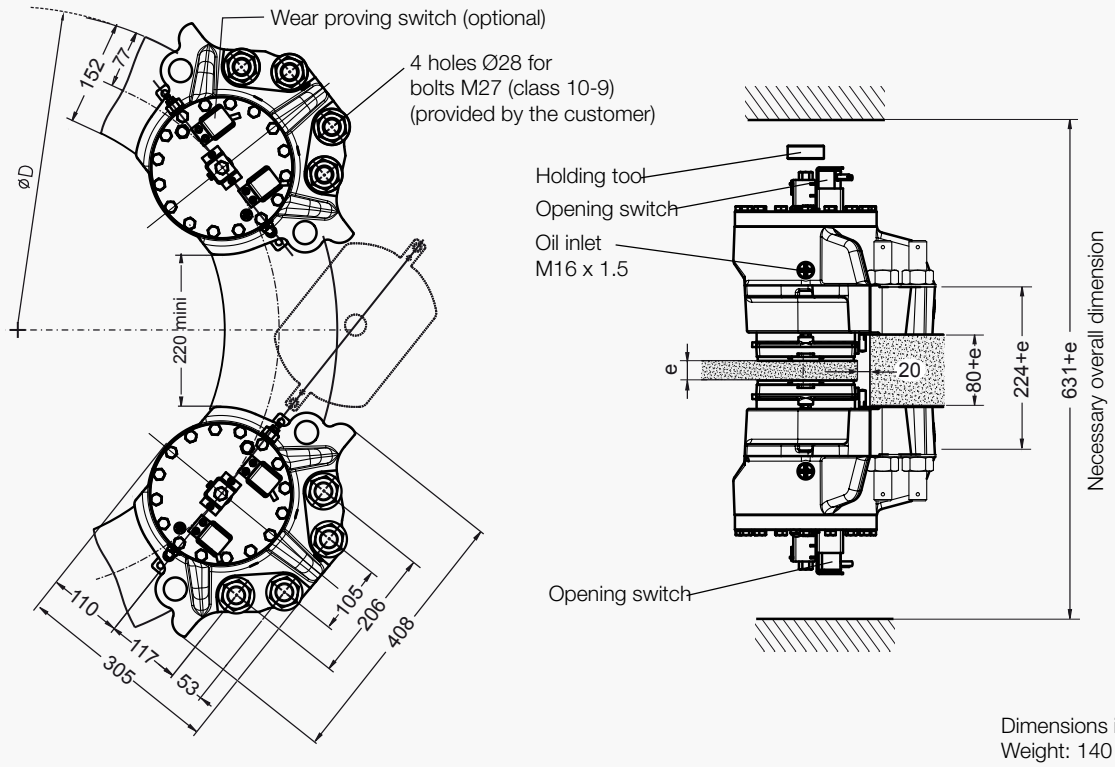
Operating conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.
- US2-1. US2-5 for low energy braking ≤ 1 MJ
- EF3-1 for high energy braking ≤ 15 MJ

Other use. consult us

Options:
- Lining wear control switch
- Switch for P.L.C. (induction sensor)
- Marine protection
- Caliper on support with integral HPP
- Option GF



Dimensions in mm
Weight: 140 kg

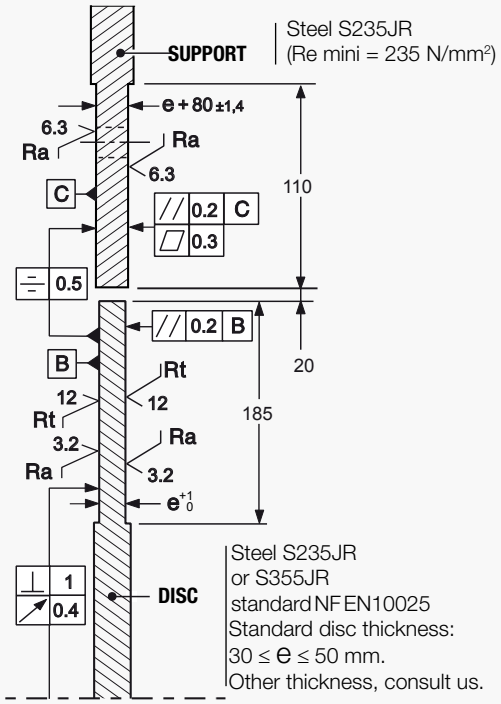
Opening proving switch:

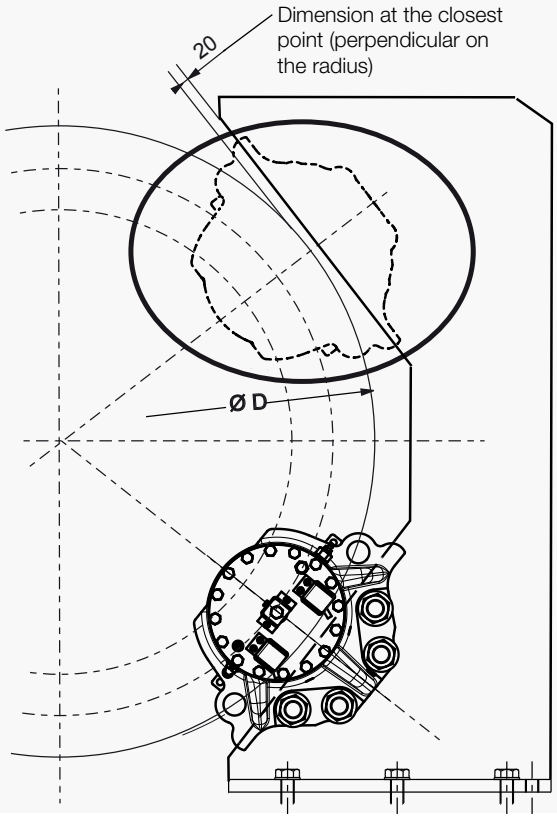
240V 1.5A AC
250V 0.1A DC
with a 5 x 0.75mm² wire
of 5m length

DISC BRAKE - SH9A CALIPER

Revision number: T10077-01-B **Revision date: 30.05.2013**

Disc and support:





Torque and effort values are subject to a variation of ±10%
Response time at nominal torque ≤ 0.3s

Designation	Caliper		SH9A-3			SH9A-2			SH9A-1		
	Lining ∗		US2-1	US2-5	EF3-1	US2-1	US2-5	EF3-1	US2-1	US2-5	EF3-1
Braking force BF for 1mm air gap	Static	N	94 500	90 000	70 500	80 100	76 200	60000	66 150	63 000	49 600
	Dynamic	N	105 000	100 000	78 200	89 000	84 700	66 500	73 500	70 000	55 000
Linear speed of the disc for BF		m/s	≤10	≤30	≤ 50●	≤10	≤30	≤ 50●	≤10	≤30	≤ 50●
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD (mm) ∗∗	995 mm	N.m	44 150	42 050	32 880	37 420	35 620	27 960	30 910	29 440	23 130
	1500 mm	N.m	70 670	67 300	52 630	59 900	57 000	44 750	49 470	47 110	37 020
	2000 mm	N.m	96 920	92 300	72 180	82 150	78 180	61 380	67 840	64 610	50 770
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.077)								
Regulation pressure	Minimum Maximum	bar	180 200			150 180			110 140		
Setting pressure of HPP limit valve		bar	225			210			165		
Total volume of oil displaced		cm^3	55 for one disc/linings stroke (nominal wear and opening)								

∗ **US2-1**: disc temperature during one braking ≤ 150°C
US2-5: disc temperature during one braking ≤ 350°C
EF3-1: High energy braking, disc temperature during one braking ≤ 600°C

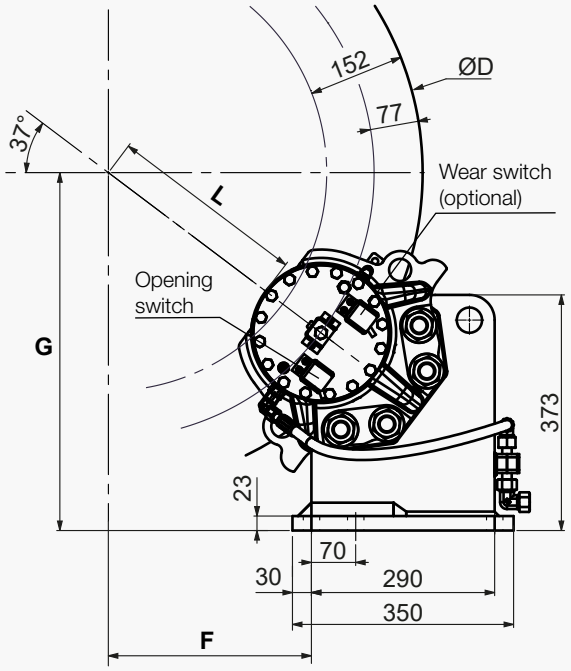
∗∗ For disc ØD < 995 mm, consult us.
● For higher speed, consult us.

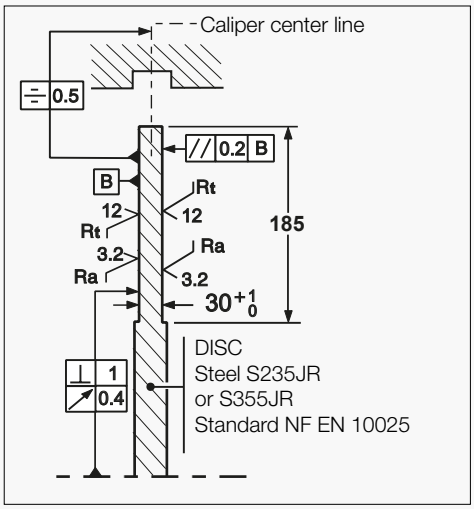
Emergency Brakes

DISC BRAKE - SHS9A CALIPER

Revision number: T10192-01-B **Revision date: 06.04.2022**

- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switches
- Lining wear switches (optional)
- Full lining wear indicator wires
- See technical data in SH9A leaflet
- Weight = 193 kg

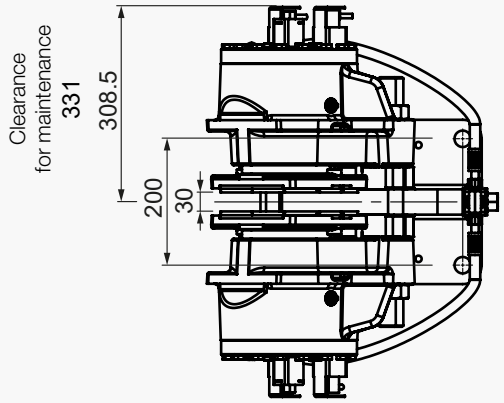


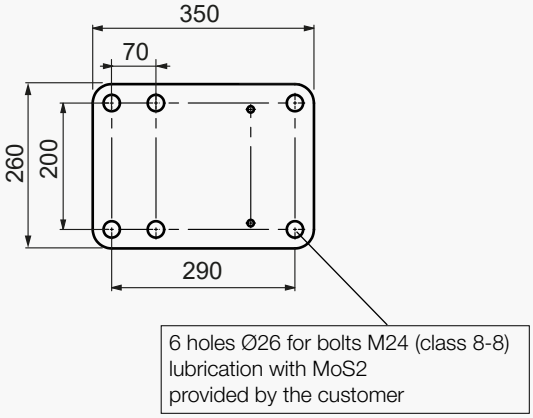


$$F = \frac{D}{2} \times \cos(37°) - 75.88$$

$$G = \frac{D}{2} \times \sin(37°) + 266.93$$

$$L = \frac{D}{2} - 190$$

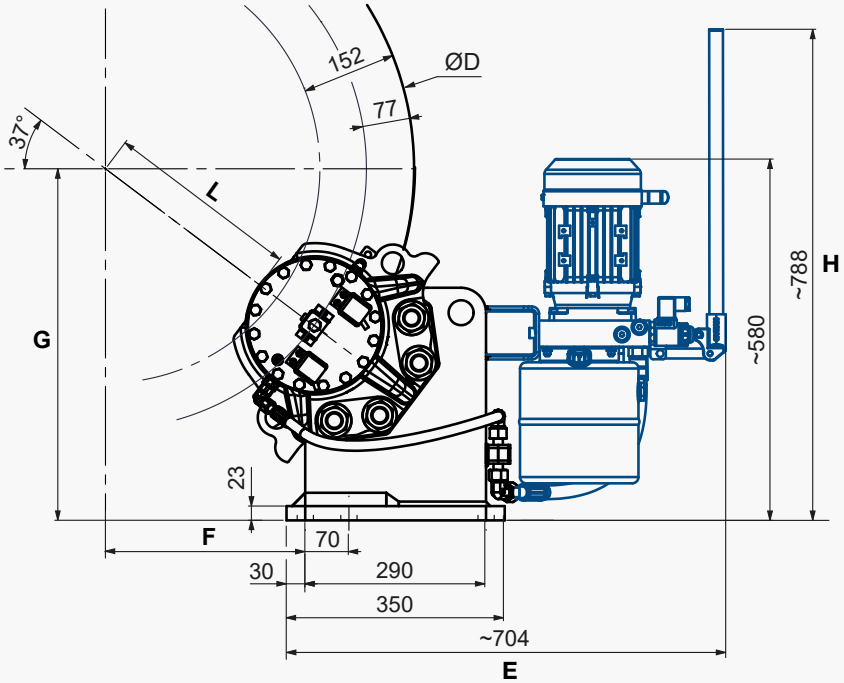


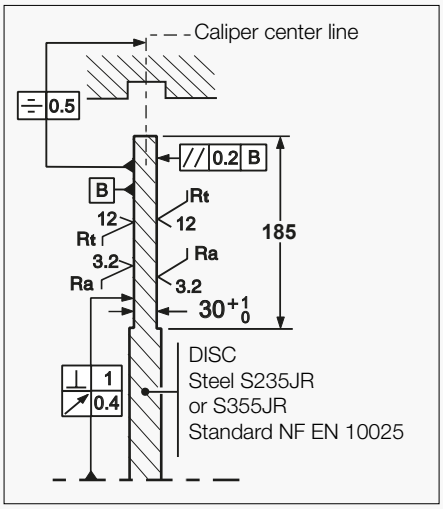


DISC BRAKE - SHC9A-SHPU1 CALIPER

Revision number: T10192-01-B **Revision date: 06.04.2022**

- Caliper mounted on a support
- SHPU1 (motor 0,75 kW) HPP connected to the caliper
- Opening switches
- Lining wear switches (optional)
- Full lining wear indicator wires
- See technical data in SH9A leaflet
- Weight = 222 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **E**≈704, **H**≈788, **P**≈251
  K-PR: **E**≈704, **H**≈788, **P**≈241
  K-SI: **E**≈787, **H**≈788, **P**≈324

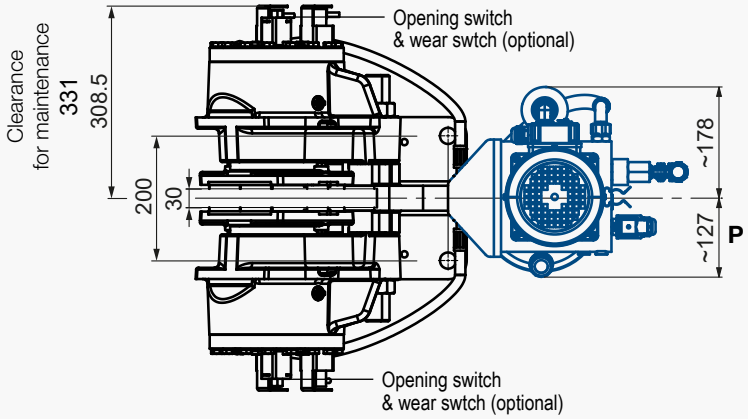


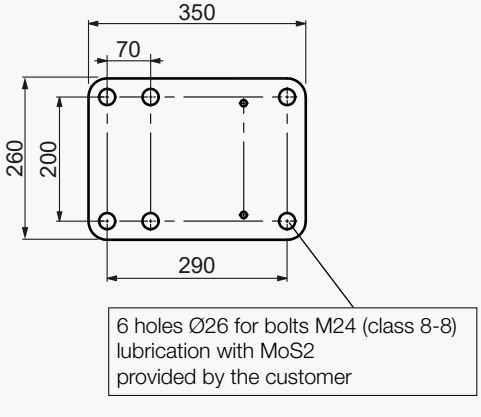


$$F = \frac{D}{2} \times \cos(37°) - 75.88$$

$$G = \frac{D}{2} \times \sin(37°) + 266.93$$

$$L = \frac{D}{2} - 190$$



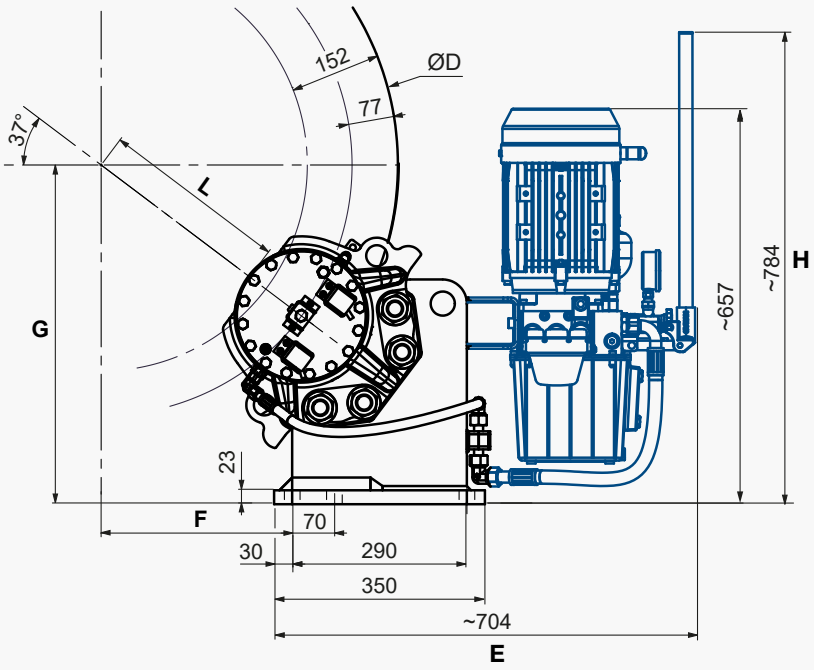


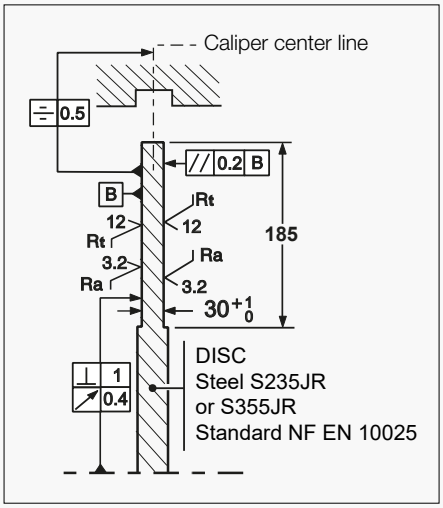
Emergency Brakes

DISC BRAKE - SHC9A-SHPU2 CALIPER

Revision number: T10192-01-B **Revision date: 06.04.2022**

- Caliper mounted on a support
- SHPU2 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear switches (optional)
- Full lining wear indicator wires
- See technical data in SH9A leaflet
- Weight = 244 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **E**≈704, **H**≈784, **P**≈294
  K-PR: **E**≈704, **H**≈784, **P**≈284
  K-SI: **E**≈772, **H**≈784, **P**≈367

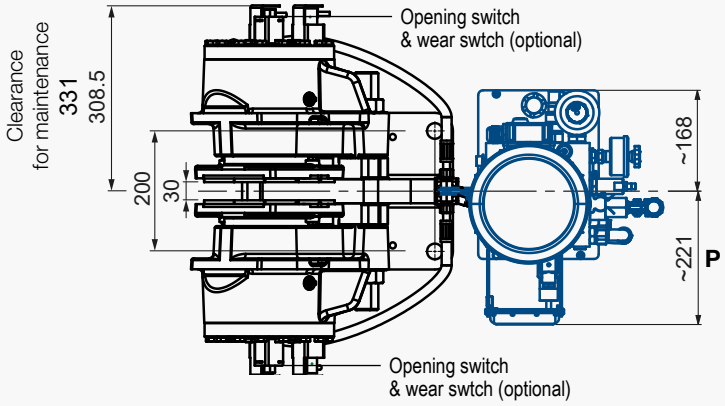


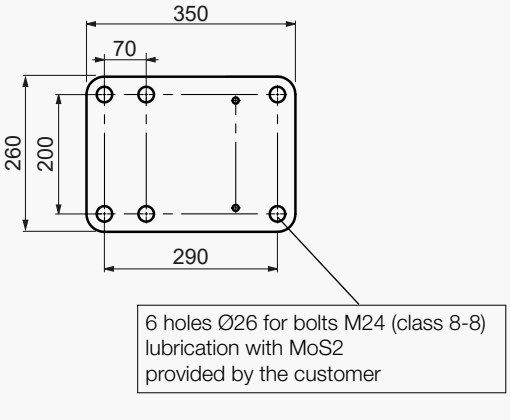


$$F = \frac{D}{2} \times \cos(37°) - 75.88$$

$$G = \frac{D}{2} \times \sin(37°) + 266.93$$

$$L = \frac{D}{2} - 190$$

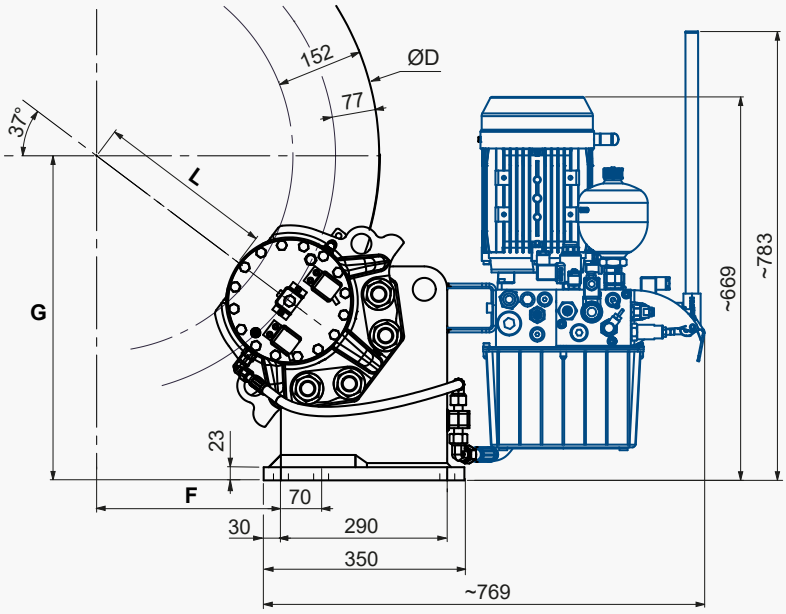


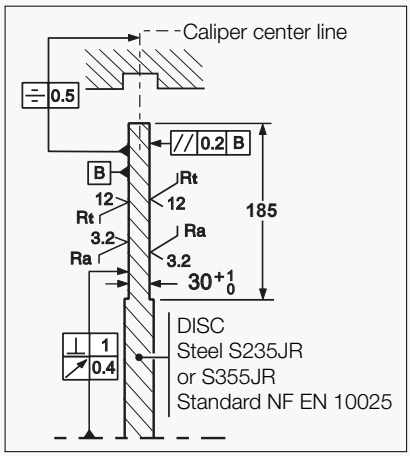


DISC BRAKE - SHC9A-SHPU3 CALIPER

Revision number: T10192-01-B **Revision date: 06.04.2022**

- Caliper mounted on a support
- SHPU3 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear switches (optional)
- Full lining wear indicator wires
- Weight = 256 kg
- Electrical unit: consult us
- See technical data in SH9A leaflet



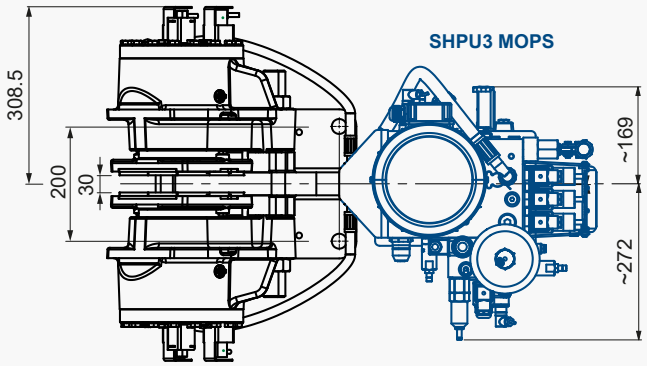


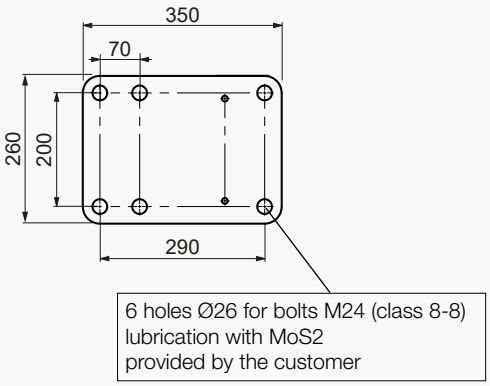
$$F = \frac{D}{2} \times \cos(37°) - 75.88$$

$$G = \frac{D}{2} \times \sin(37°) + 266.93$$

$$L = \frac{D}{2} - 190$$

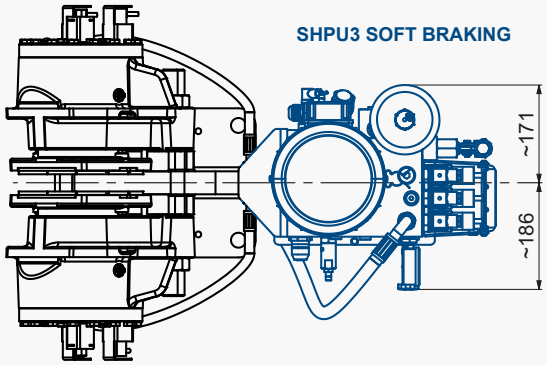
SHPU3 MOPS





6 holes Ø26 for bolts M24 (class 8-8)
lubrication with MoS2
provided by the customer

SHPU3 SOFT BRAKING



Emergency Brakes

DISC BRAKE - SH15 CALIPER

Revision number: T03905-01-B **Revision date: 01.10.2021**

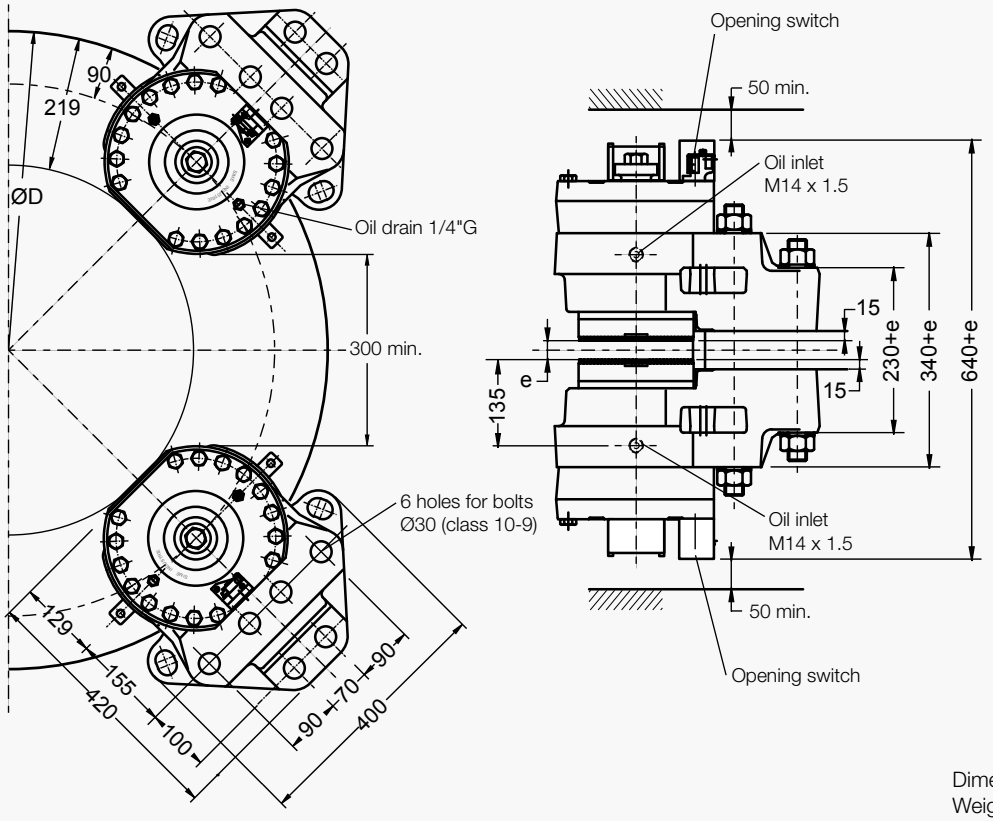
Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear detector

Operating conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains, Other use. consult us.

Options:
- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power pack



Dimensions in mm
Weight: 250kg

Opening proving switch:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

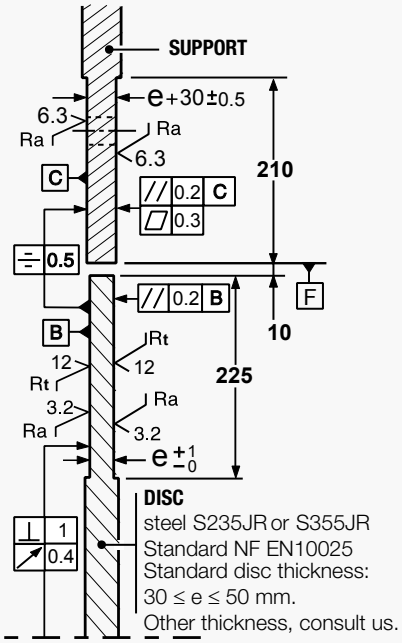
220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

Compatible with PLC
(Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

DISC BRAKE - SH15 CALIPER

Revision number: T03905-01-B **Revision date: 01.10.2021**

Disc and support

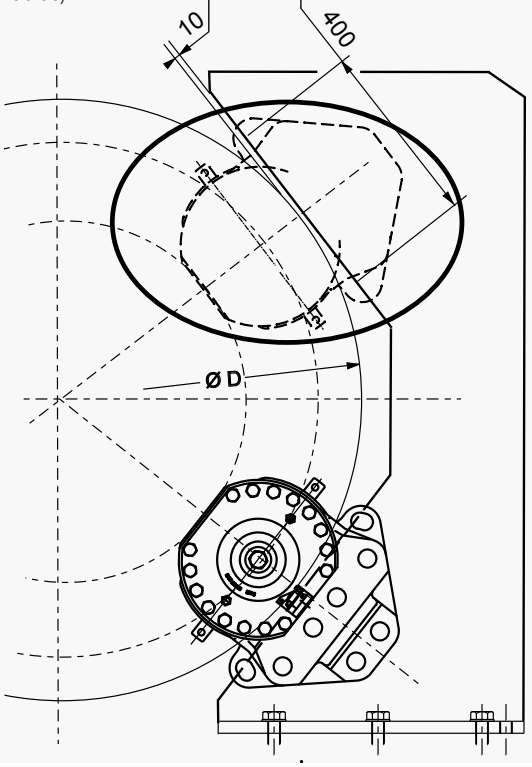


steel S235JR or S355JR
Standard NF EN10025
Standard disc thickness:
30 ≤ e ≤ 50 mm.
Other thickness, consult us.

Dimensions in mm

Dimension at the closest point (perpendicular on the radius)

The support **F** face **must be** rectilinear on the length.



Torque and effort values are subject to a variation of ±10%

Response time at nominal torque: see the leaflet n° G08555-01

Designation	Caliper		SH15-3		SH15-2		SH15-1	
	Lining ✳		US2-1	US2-4	US2-1	US2-4	US2-1	US2-4
Braking force BF for 1mm of air gap disc/lining	Static	N	133 000	99 000	110 000	80 000	90 000	66 000
	Dynamic	N	150 000	110 000	120 000	88 000	100 000	73 000
Linear speed of the disc		m/s	≤ 10	≤ 50	≤ 10	≤ 50	≤ 10	≤ 50
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD	1000 mm	N.m	61 500	45 100	49 200	36 080	41000	29930
	1200 mm	N.m	76 500	56 100	62 200	44 880	51 000	37 230
	1500 mm	N.m	99 000	72 600	79 200	58 080	66 000	48 180
	2000 mm	N.m	136 500	100 100	109 200	80 080	91 000	66 430
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.09)					
Regulation pressure	minimum	bar	150		140		110	
	maximum	bar	180		160		140	
Setting pressure of limit valve of the hydraulic unit		bar	205		205		165	
Total volume of oil displaced		cm^3	85 for one stroke disc/lining (nominal wear and opening)					

✳ **US2-1**: disc temperature during one braking ≤ 150°C
US2-4: disc temperature during one braking ≤ 600°C

US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

Emergency Brakes

DISC BRAKE - SH18B CALIPER

Revision number: T03907-01-B **Revision date: 08.10.2010**

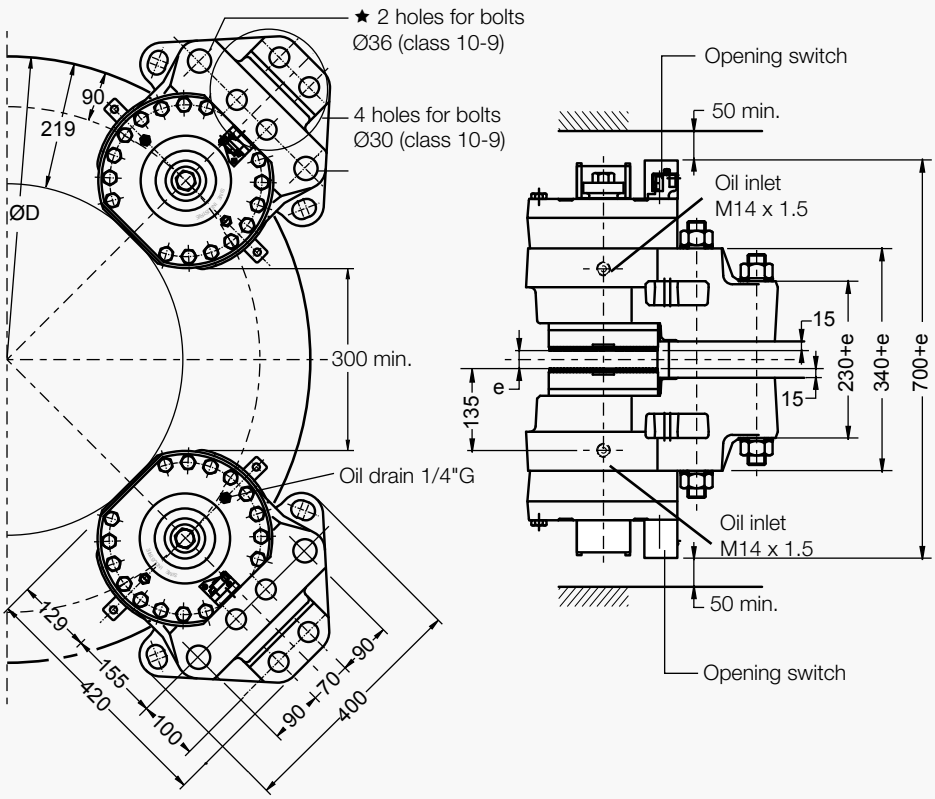
Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear detector

Operating conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:
- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power pack



Dimensions in mm
Weight: 270kg

Opening proving switch:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

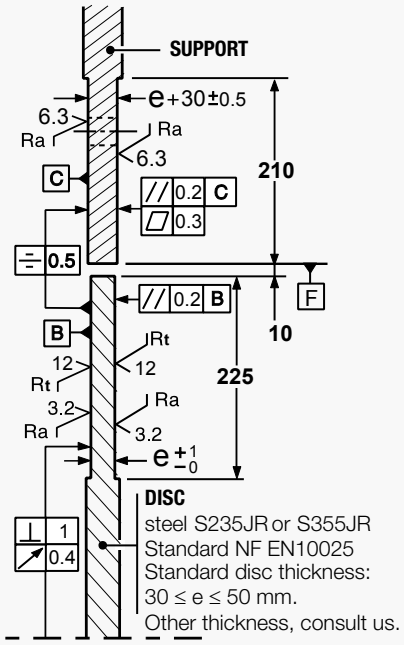
220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

Compatible with PLC
(Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

DISC BRAKE - SH18B CALIPER

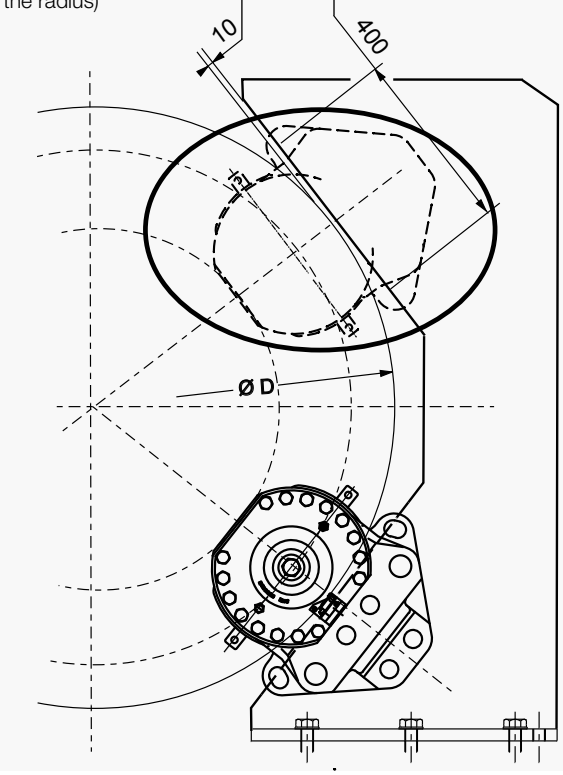
Revision number: T03907-01-B **Revision date: 08.10.2010**

Disc and support



Dimension at the closest point (perpendicular on the radius)

The support **F** face **must be** rectilinear on the length.



Torque and effort values are subject to a variation of ±10%
Response time at nominal torque: see the leaflet n° G08555-01

Designation	Caliper		SH18B	
	Lining ✳		US2-1	US2-4
Braking force BF for 1mm of air gap disc/ lining	Static	N	160 000	117 400
	Dynamic	N	180 000	130 500
Linear speed of the disc		m/s	≤ 10	≤ 50
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD	1000 mm	N.m	73 800	53 500
	1200 mm	N.m	91 800	66 500
	1500 mm	N.m	118 800	86 100
	2000 mm	N.m	163 800	118 700
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.09)	
Regulation pressure	minimum	bar	180	
	maximum	bar	200	
Setting pressure of limit valve of the hydraulic unit		bar	225	
Total volume of oil displaced		cm^3	85 for one stroke disc/lining (nominal wear and opening)	

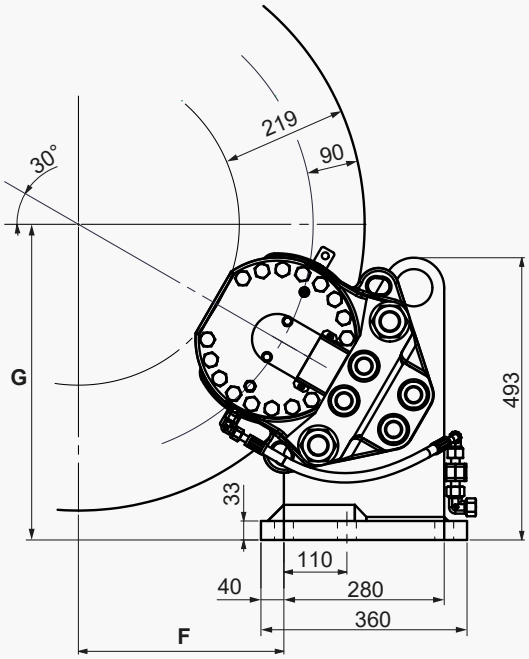
✳ **US2-1**: disc temperature during one braking ≤ 150°C
US2-4: disc temperature during one braking ≤ 600°C
US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

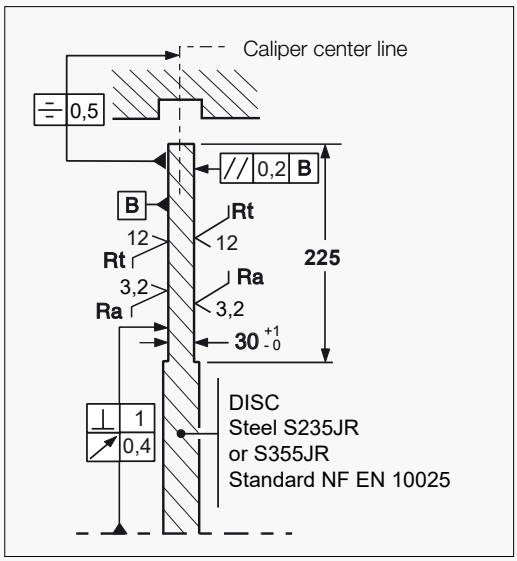
Emergency Brakes

DISC BRAKE - SHS15, SHS18B CALIPERS

Revision number: T10193-01-A **Revision date: 03.12.2021**

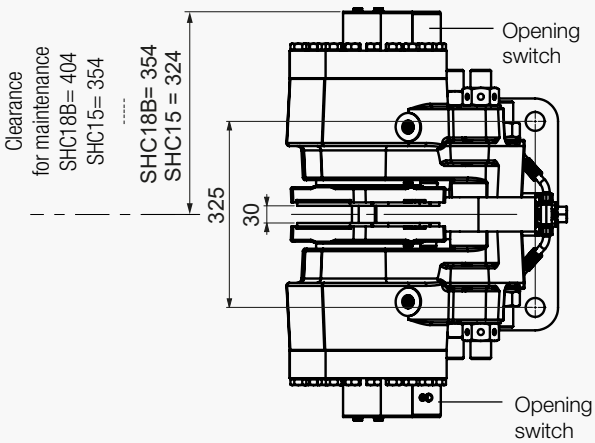
- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switches
- Lining wear indicator wires
- See technical data in SH15 and SH18B leaflets
- Weight = 378 kg

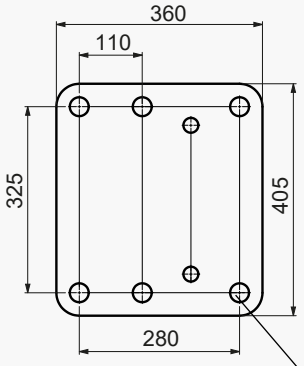




$$F = \frac{D}{2} \times \cos(30°) - 74.05$$

$$G = \frac{D}{2} \times \sin(30°) + 301.25$$



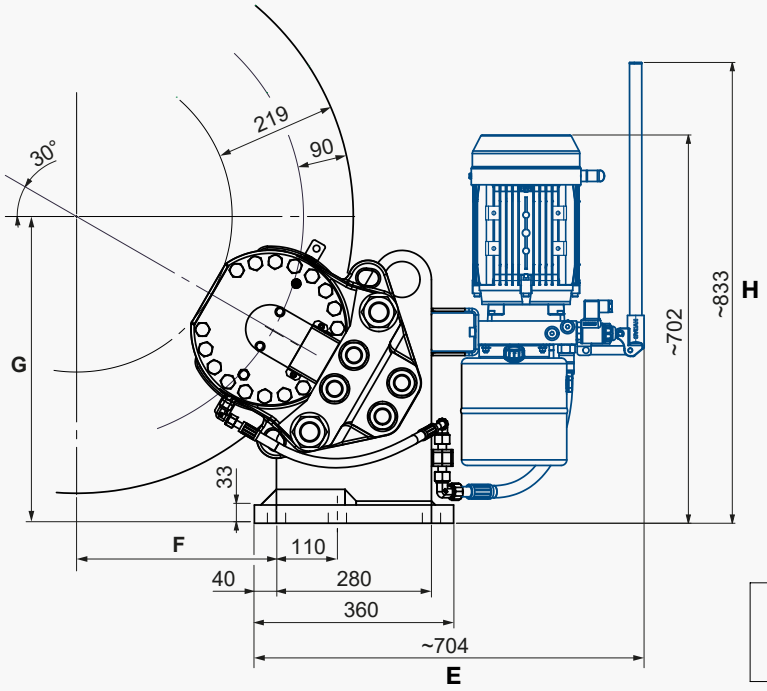


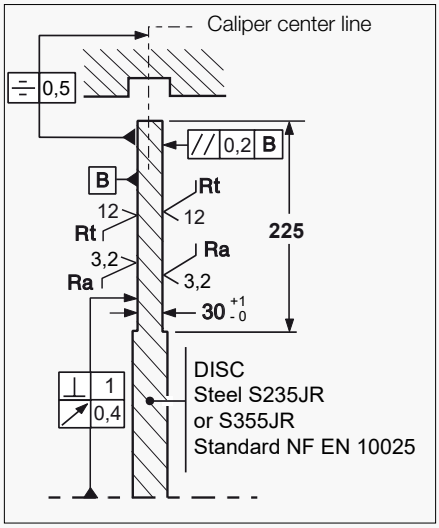
6 holes Ø33 for bolts M30 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHC15, SHC18B CALIPERS WITH SHPU1

Revision number: T10193-01-A **Revision date: 03.12.2021**

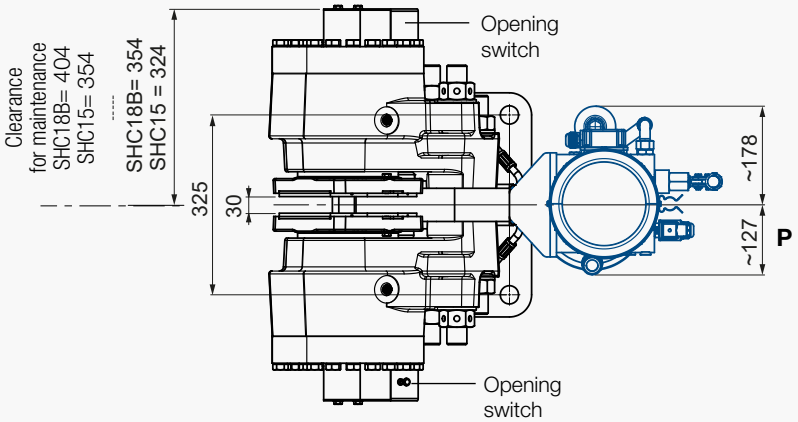
- Caliper mounted on a support
- SHPU1 (motor 2,2 kW) HPP connected to the caliper
- Opening switches
- Lining wear indicator wires
- See technical data in SH15 and SH18B leaflets
- Weight = 416 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **E**≈704, **H**≈833, **P**≈271
  K-PR: **E**≈704, **H**≈833, **P**≈261
  K-SI: **E**≈777, **H**≈833, **P**≈344

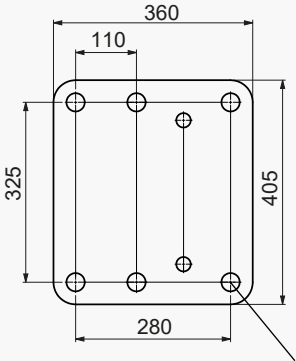




$$F = \frac{D}{2} \times \cos(30°) - 74.05$$

$$G = \frac{D}{2} \times \sin(30°) + 301.25$$



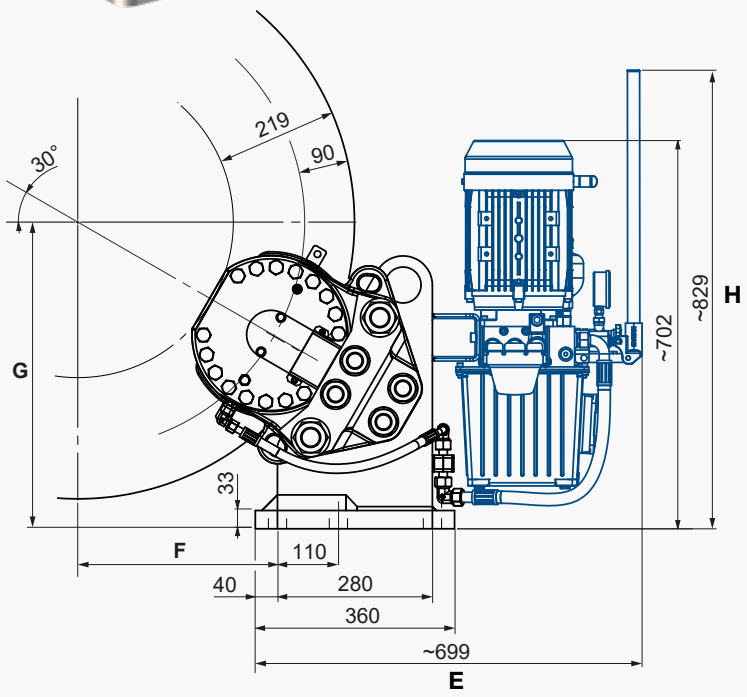


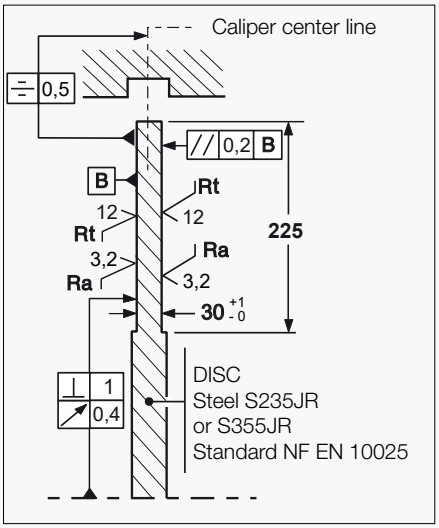
6 holes Ø33 for bolts M30 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHC15, SHC18B CALIPERS WITH SHPU2

Revision number: T10193-01-A **Revision date: 03.12.2021**

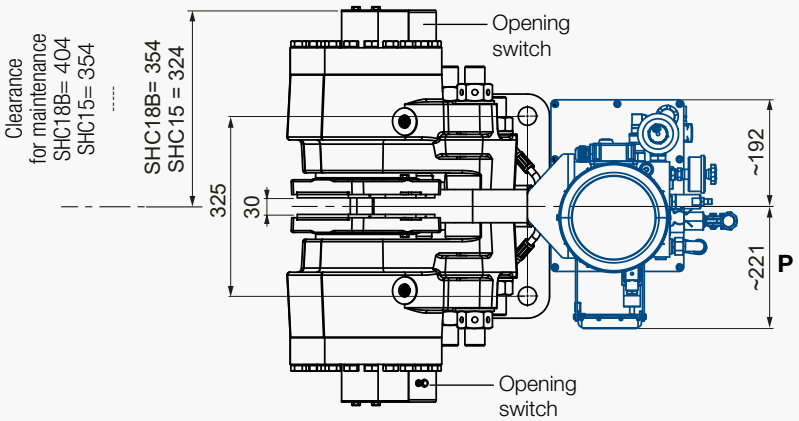
- Caliper mounted on a support
- SHPU2 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear indicator wires
- See technical data in SH15 and SH18B leaflets
- Weight = 426 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **E**≈699, **H**≈829, **P**≈294
  K-PR: **E**≈699, **H**≈829, **P**≈284
  K-SI: **E**≈762, **H**≈829, **P**≈367

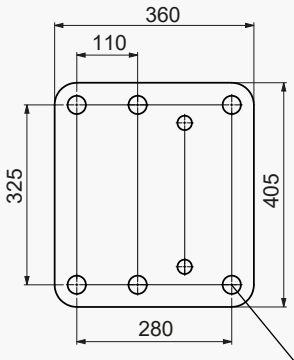




$F = \frac{D}{2} \times \cos(30°) - 74.05$

$G = \frac{D}{2} \times \sin(30°) + 301.25$



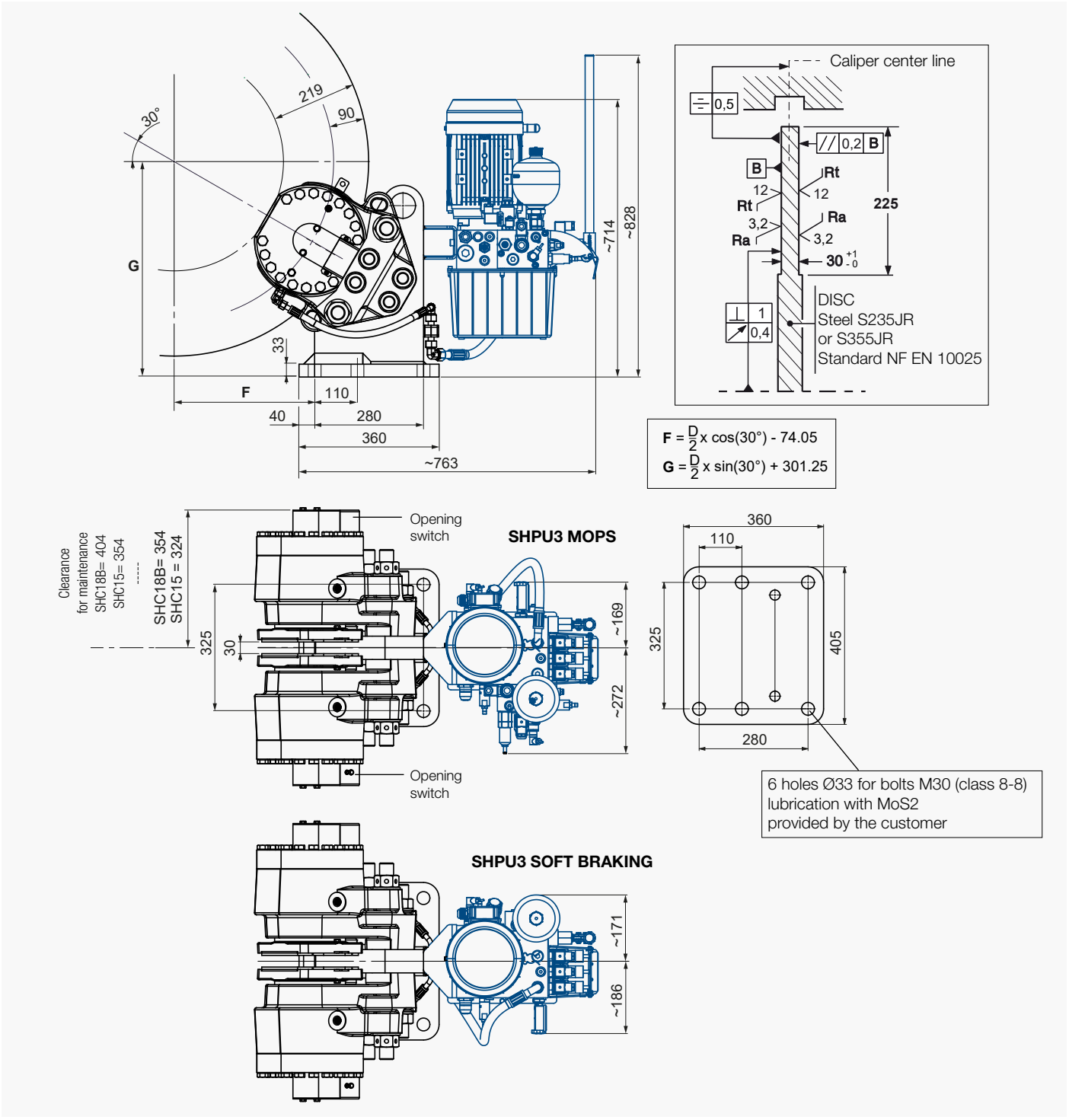


6 holes Ø33 for bolts M30 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHC15, SHC18B CALIPERS WITH SHPU3

Revision number: T10193-01-A **Revision date: 03.12.2021**

- Caliper mounted on a support
- SHPU3 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear indicator wires
- Weight = 440 kg
- Electrical unit: consult us
- See technical data in SH15 and SH18B leaflets



Emergency Brakes

DISC BRAKE - SH25 CALIPER

Revision number: T03915-01-B **Revision date: 21.10.2010**

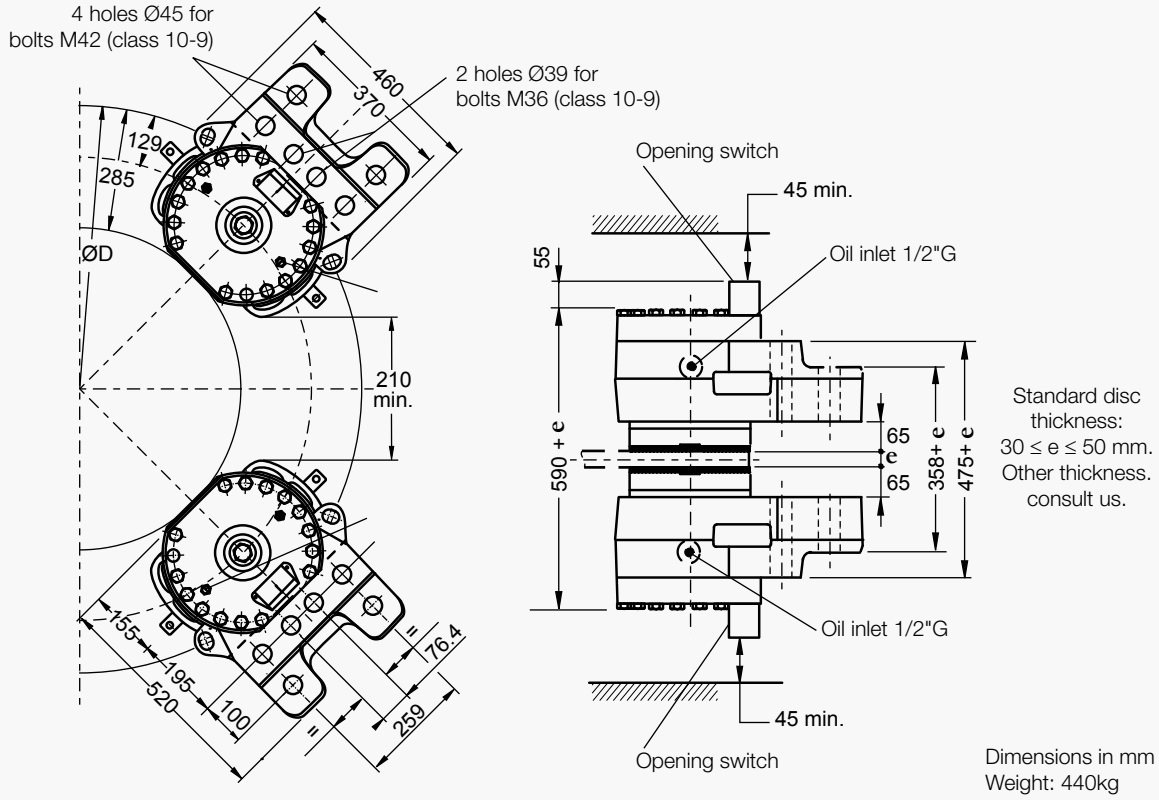
Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear detector

Operating conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:
- Lining wear control switch
- Progressive braking system
- Marine protection
- Caliper on support with integral hydraulic power pack



Opening proving switch:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

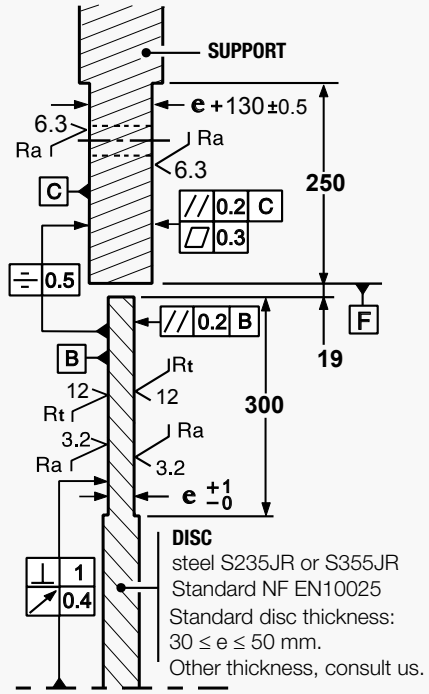
220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

Compatible with PLC
(Programmable Logic
Controllers).
An opening switch used with other equipment
than PLC must not be reused with a PLC.

DISC BRAKE - SH25 CALIPER

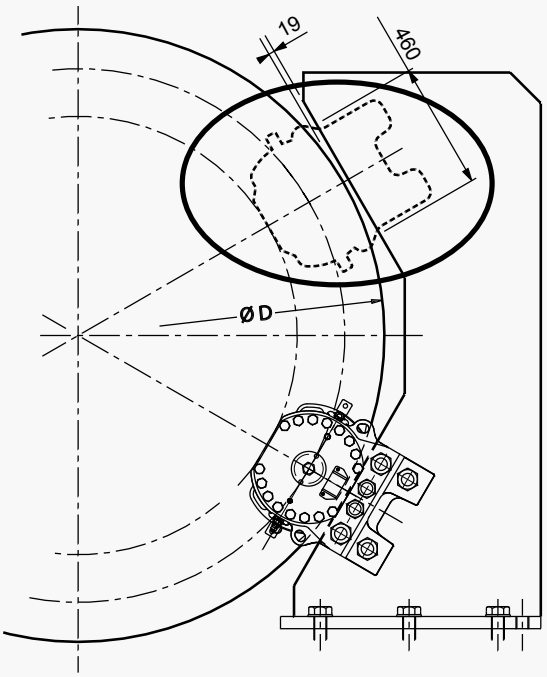
Revision number: T03915-01-B **Revision date: 21.10.2010**

Disc and support



Dimension at the closest point (perpendicular on the radius)

The support **F** face **must be** rectilinear on this length



Torque and effort values are subject to a variation of ±10%
Response time at nominal torque: see the leaflet n° G08555-01

Designation	Caliper		SH25-2		SH25-1	
	Lining ✳		US2-1	US2-4	US2-1	US2-4
Braking force BF for 1mm of air gap disc/lining	Static N	N	225 000	165 000	160 000	120 000
	Dynamic N	N	250 000	184 000	180 000	134 000
Linear speed of the disc		m/s	≤ 10	≤ 50	≤ 10	≤ 50
Dynamic braking torque BT (N.m) for 1 caliper and disc ØD (mm)	1500 mm	N.m	155 250	114 260	111 780	83 210
	2000 mm	N.m	217 750	160 260	156 780	116 710
	2500 mm	N.m	280 250	206 260	201 780	150 210
	3000 mm	N.m	342 750	252 260	246 780	183 710
BT for other ØD (mm)		N.m	BT = BF (D/2000 - 0.129)			
Regulation pressure	minimum	bar	180		140	
	maximum	bar	200		160	
Setting pressure limit valve of hydraul. Unit		bar	225		205	
Total volume of oil displaced		cm^3	140 for one stroke disc/lining (nominal wear and opening)			

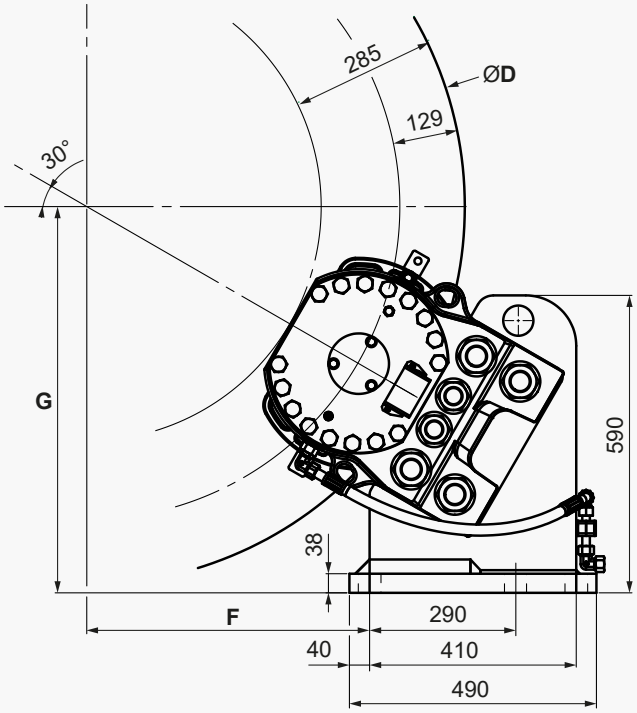
✳ **US2-1**: disc temperature during one braking ≤ 150°C
US2-4: disc temperature during one braking ≤ 600°C
US2-5: tdisc temperature during one braking ≤ 350°C, optional, consult us.

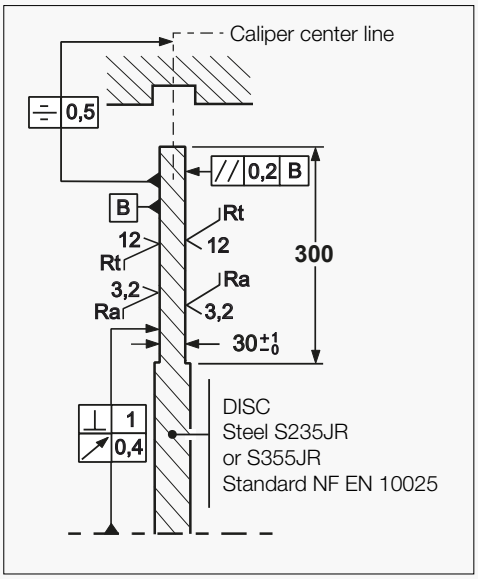
Emergency Brakes

DISC BRAKE - SHS25 CALIPER

Revision number: T10194-01-A **Revision date: 06.12.2021**

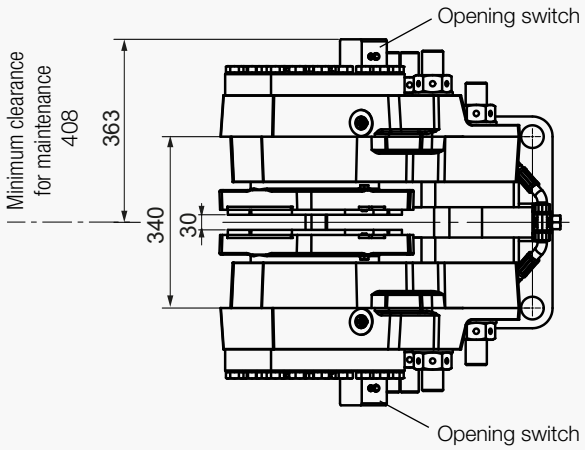
- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switch
- Lining wear indicator wires
- See technical data in SH25 leaflet
- Weight = 703 kg

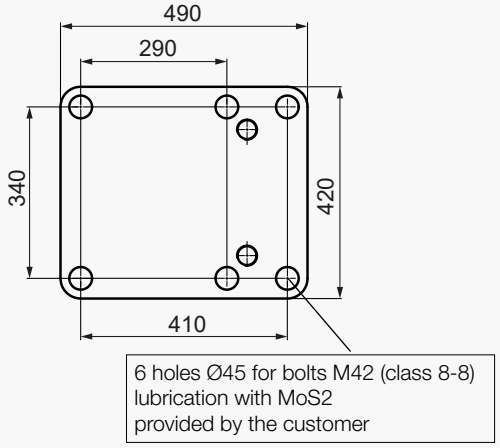




$$F = \frac{D}{2} \times \cos(30°) - 88.42$$

$$G = \frac{D}{2} \times \sin(30°) + 391.15$$



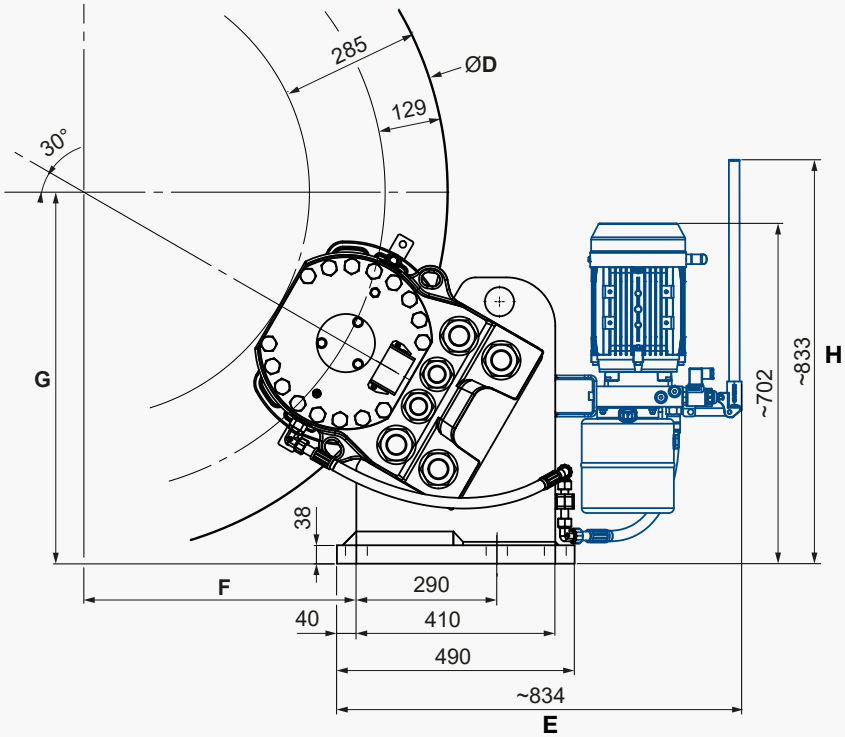


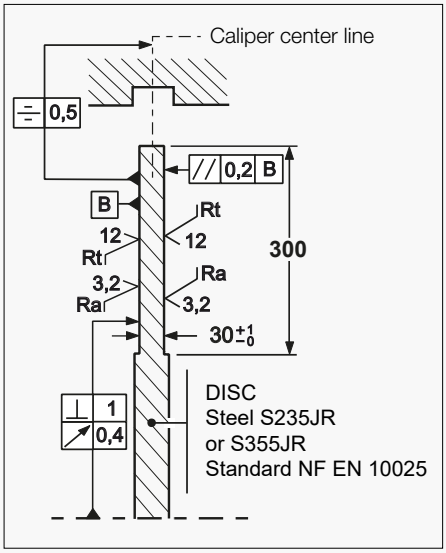
DISC BRAKE - SHC25-SHPU1 CALIPER

Revision number: T10194-01-A **Revision date: 06.12.2021**

- Caliper mounted on a support
- SHPU1 (motor 2,2 kW) HPP connected to the caliper
- Opening switch
- Lining wear indicator wires
- See technical data in SH25 leaflet
- Weight = 1075 kg
- Dimensions with electrical control unit:

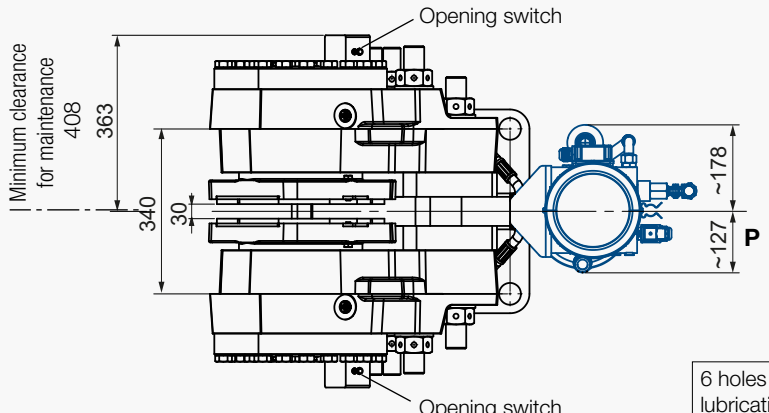
  K-TB or **K-BA**: **E**≈834, **H**≈833, **P**≈271
  K-PR: **E**≈834, **H**≈833, **P**≈261
  K-SI: **E**≈907, **H**≈833, **P**≈344

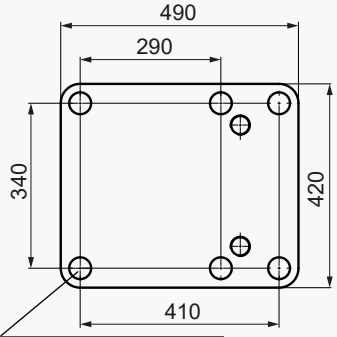




$$F = \frac{D}{2} \times \cos(30°) - 88.42$$

$$G = \frac{D}{2} \times \sin(30°) + 391.15$$





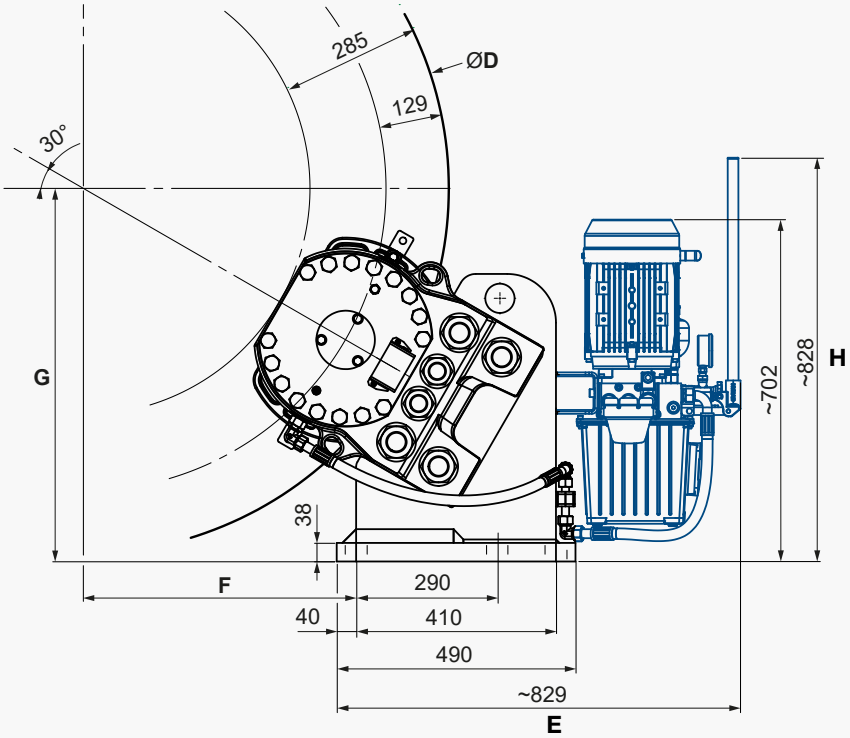
6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

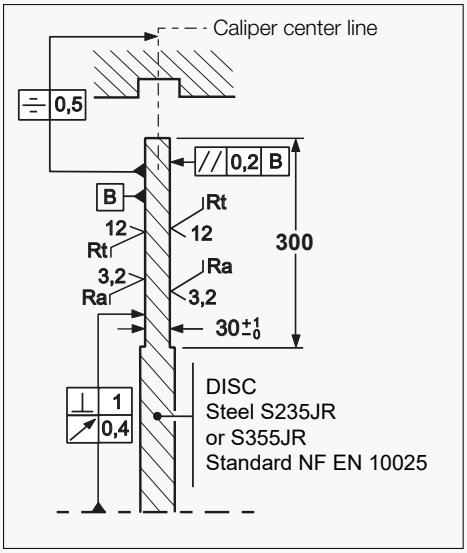
Emergency Brakes

DISC BRAKE - SHC25-SHPU2 CALIPER

Revision number: T10194-01-A **Revision date: 06.12.2021**

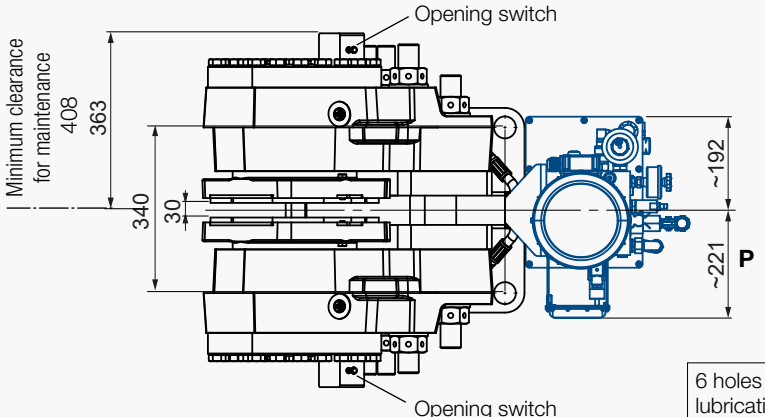
- Caliper mounted on a support
- SHPU2 (motor 2,2 kW) connected to the caliper
- Opening switch
- Lining wear indicator wires
- See technical data in SH25 leaflet
- Weight = 1200 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **E**≈829, **H**≈829, **P**≈294
  K-PR: **E**≈829, **H**≈829, **P**≈284
  K-SI: **E**≈892, **H**≈829, **P**≈367

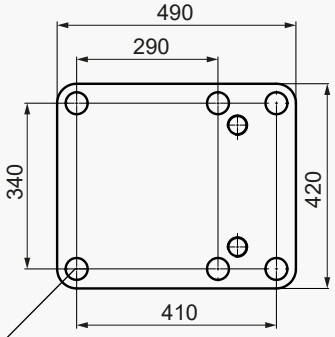




$$F = \frac{D}{2} \times \cos(30°) - 88.42$$

$$G = \frac{D}{2} \times \sin(30°) + 391.15$$



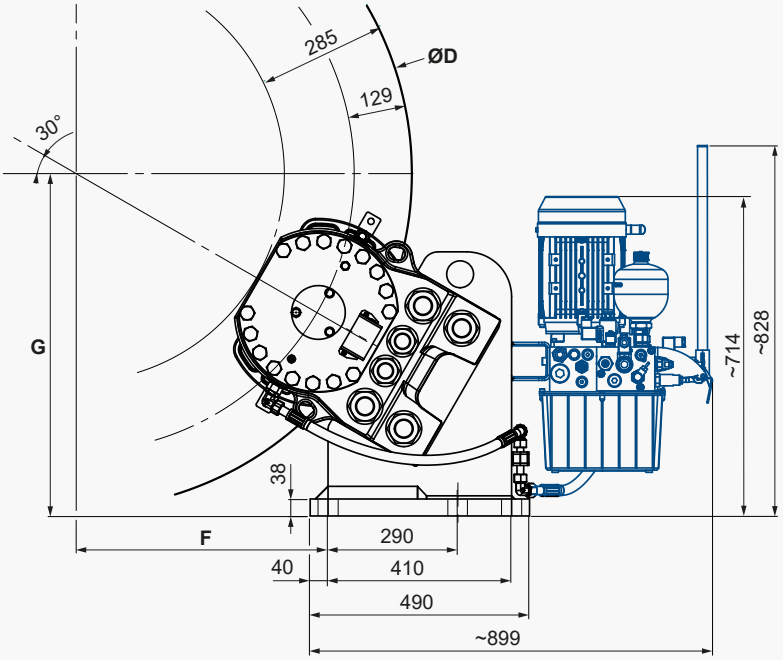


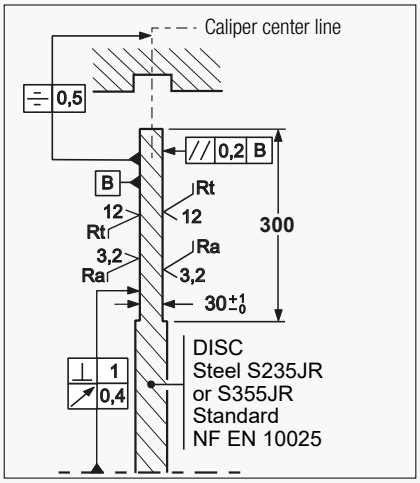
6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHC25-SHPU3 CALIPER

Revision number: T10194-01-A **Revision date: 06.12.2021**

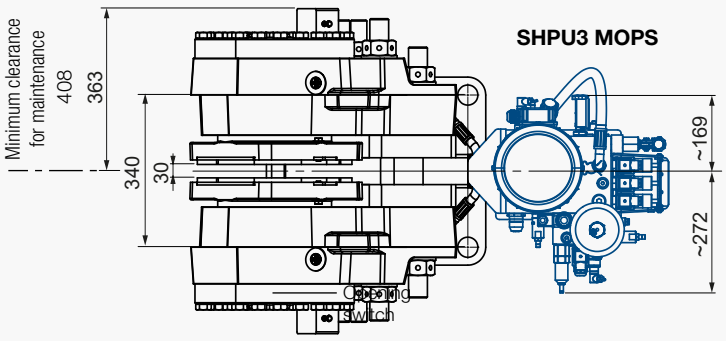
- Caliper mounted on a support
- SHPU3 (motor 2,2 kW) connected to the caliper
- Opening switch
- Lining wear indicator wires
- Weight = 1227 kg
- Electrical unit: consult us
- See technical data in SH25 leaflet

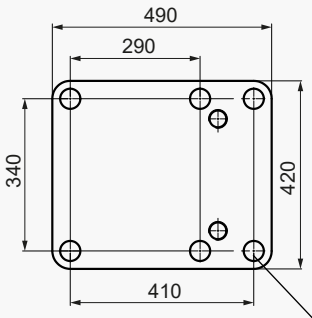




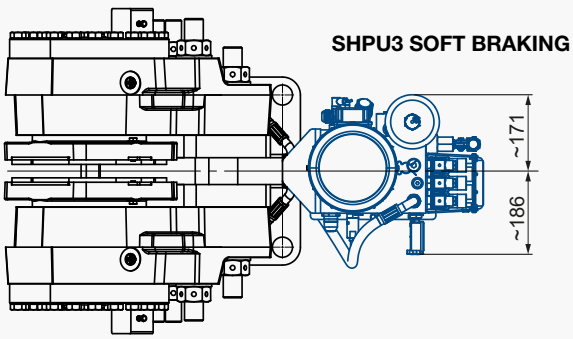
$F = \frac{D}{2} \times \cos(30°) - 88.42$

$G = \frac{D}{2} \times \sin(30°) + 391.15$





6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer



Emergency Brakes

DISC BRAKE - SH32 CALIPER

Revision number: T10040-01-D **Revision date: 22.03.2021**

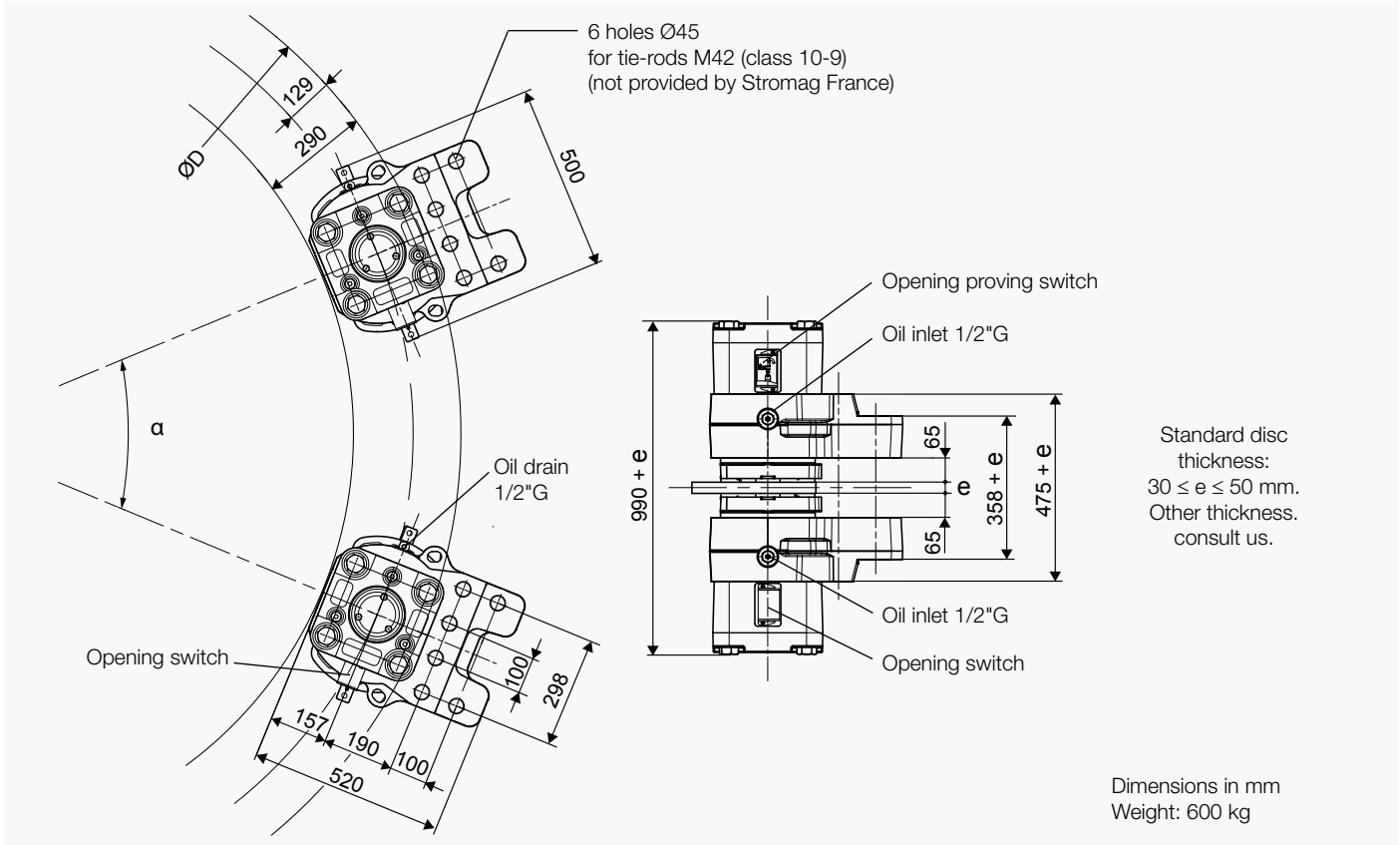
Emergency brake
Fail safe
Spring application
Hydraulic release
Opening proving switches
Lining wear indicator wires

Operating conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:
- Lining wear proving switches
- Progressive braking system
- Marine protection



Opening proving switches
Wear proving switches (optional):

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

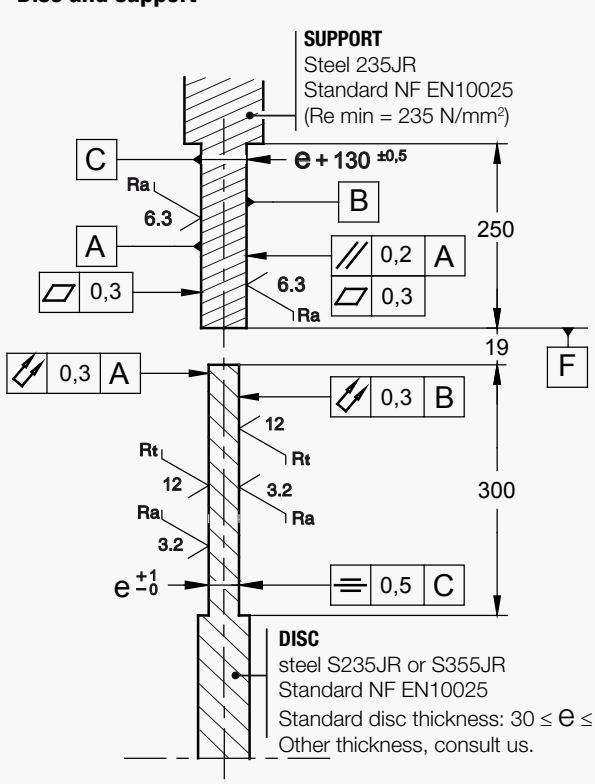
220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

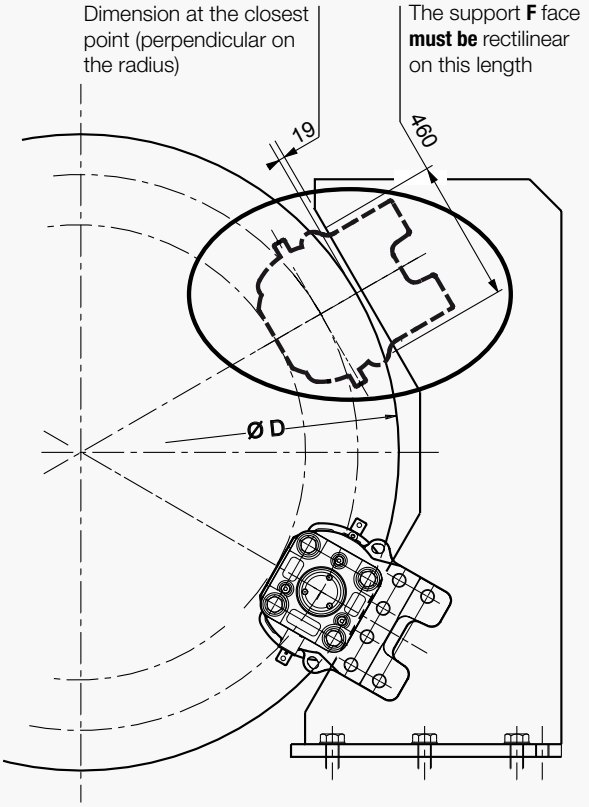
Compatible with PLC (Programmable Logic Controllers).
An opening switch used with other equipment than PLC must not be reused with a PLC.

DISC BRAKE - SH32 CALIPER

Revision number: T10040-01-D **Revision date: 22.03.2021**

Disc and support





IMPORTANT

BRAKING FORCE and **TORQUE** values correspond to lining quality **US2-1** and disc steel S235JR or S355JR (standard NF EN10025), these values are subject to a variation of ±10%.

Response time at nominal torque ≤ 0.3s

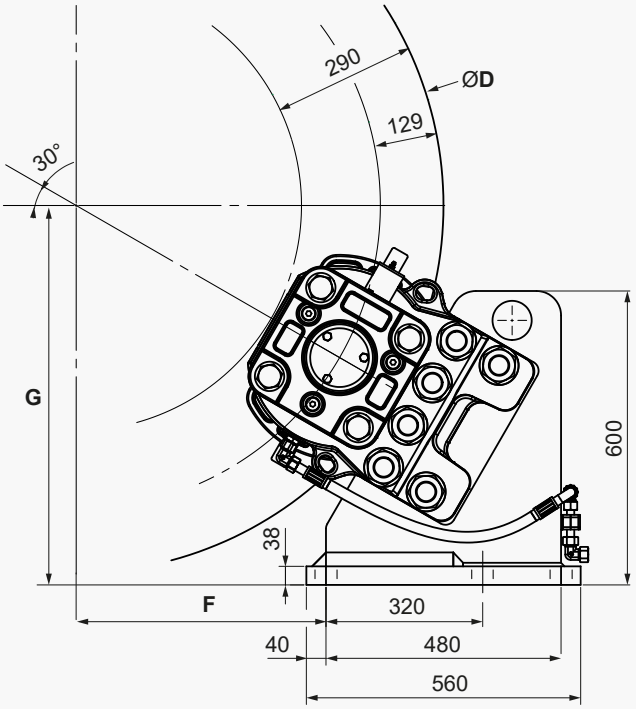
Designation	Caliper		SH32
	Lining		US2-1
BRAKING FORCE BF for air gap disc/lining of **2 x 1.5 mm**		**Dynamic** N Static N	**333 800** 300 000
BRAKING FORCE BF for air gap disc/lining of **2 x 2 mm**		**Dynamic** N Static N	**320 000** 288 000
Linear speed of the disc		m/s	≤ 10
DYNAMIC BRAKING TORQUE BT for 1 caliper and disc ØD (mm)		N.m	BT = BF (D/2000 - 0.129)
Regulation pressure	minimum maximum	bar bar	180 200
Setting pressure limit valve of hydraulic unit		bar	225
Total volume of oil displaced for air gap disc/lining of 2 x 2 mm		cm^3	191 for one stroke disc/lining

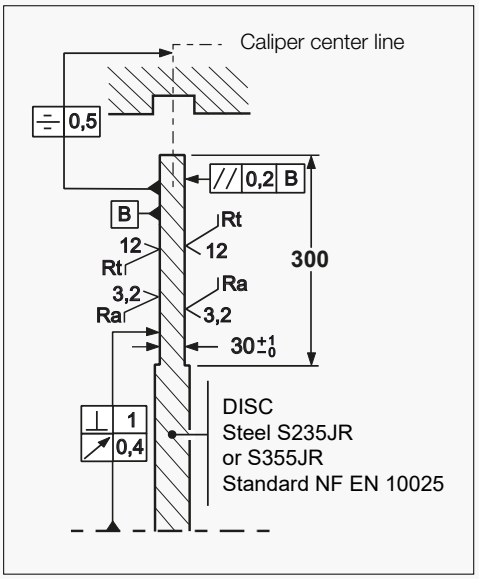
Emergency Brakes

DISC BRAKE - SHS32 CALIPER

Revision number: T10195-01-A **Revision date: 08.12.2021**

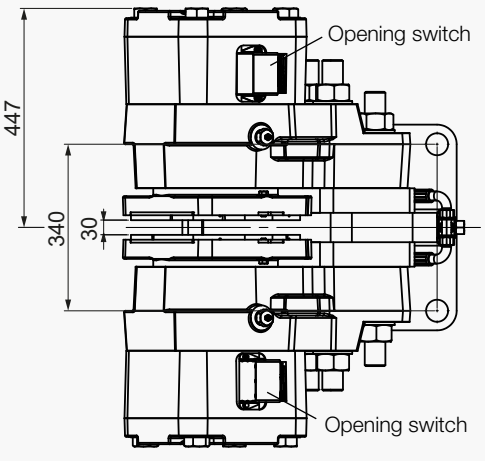
- Caliper mounted on a support
- Hydraulic connection for SHPU Hydraulic Power Pack
- Opening switch
- Lining wear indicator wires
- See technical data in SH32 leaflet
- Weight = 1729 kg

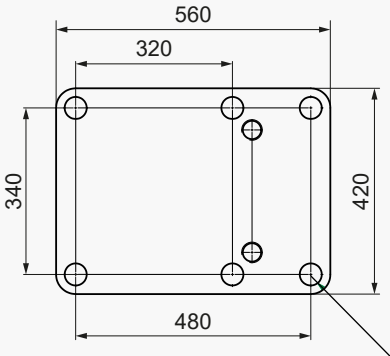




$$F = \frac{D}{2} \times \cos(30°) - 139.45$$

$$G = \frac{D}{2} \times \sin(30°) + 399.54$$



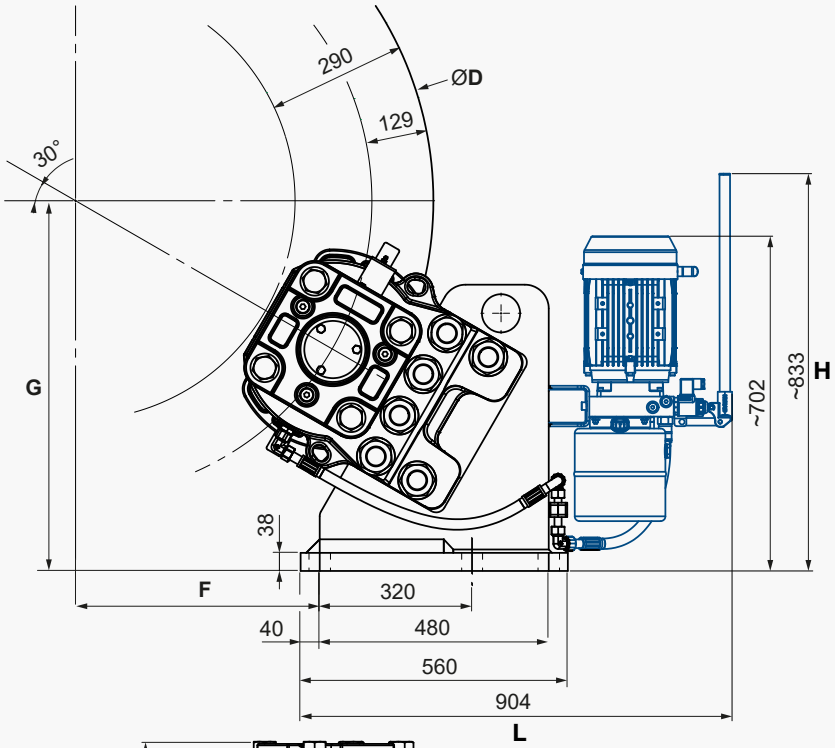


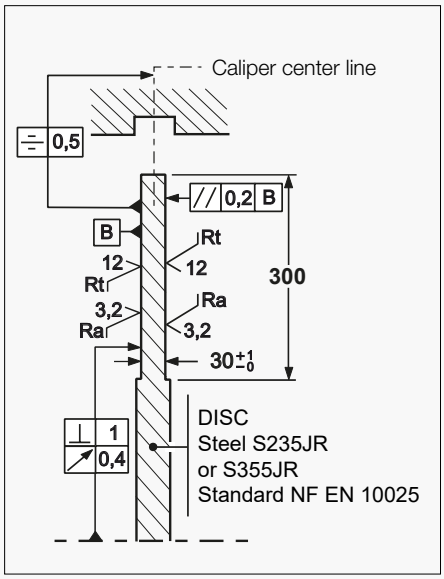
6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHC32-SHPU1 CALIPER

Revision number: T10195-01-A **Revision date: 08.12.2021**

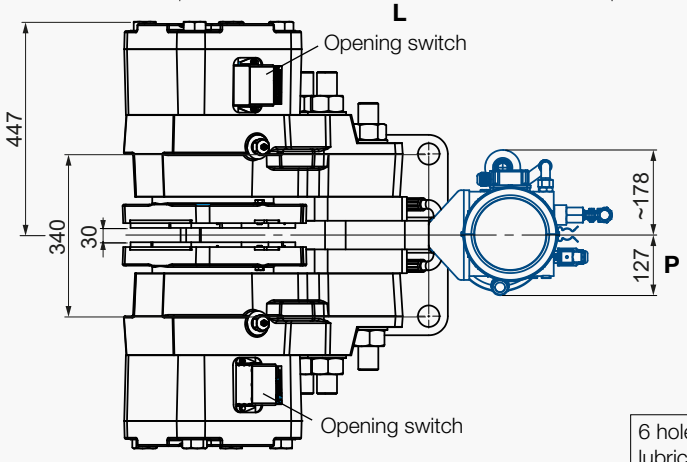
- Caliper mounted on a support
- SHPU1 (motor 2,2 kW) HPP connected to the caliper
- Opening switches
- Lining wear indicator wires
- See technical data in SH32 leaflet
- Weight = 2110 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **L**≈904, **H**≈833, **P**≈271
  K-PR: **L**≈904, **H**≈833, **P**≈261
  K-SI: **L**≈977, **H**≈833, **P**≈344

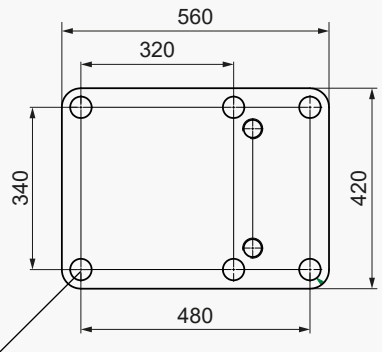




$$F = \frac{D}{2} \times \cos(30°) - 139.45$$

$$G = \frac{D}{2} \times \sin(30°) + 399.54$$





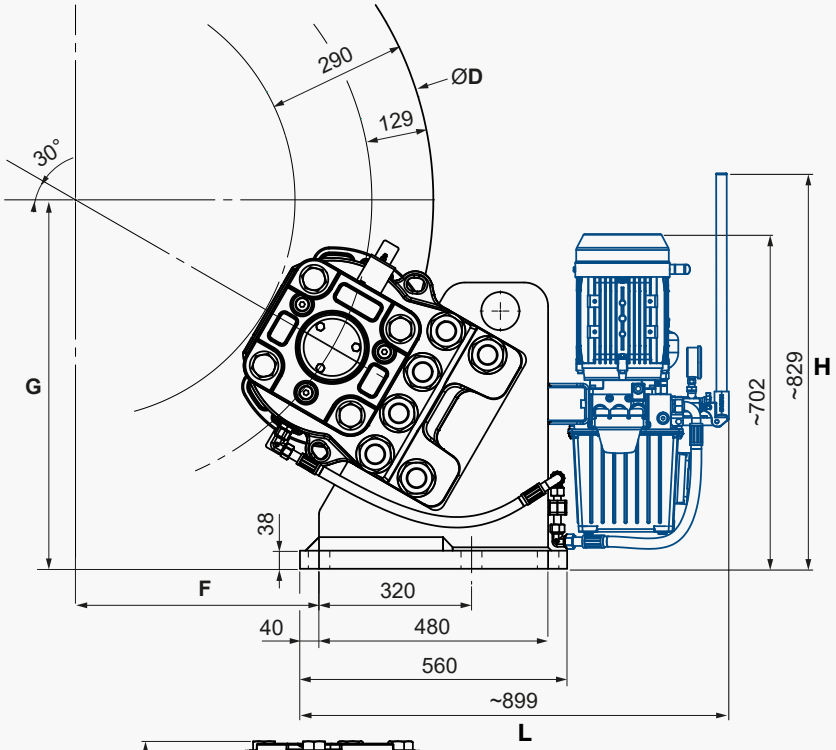
6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

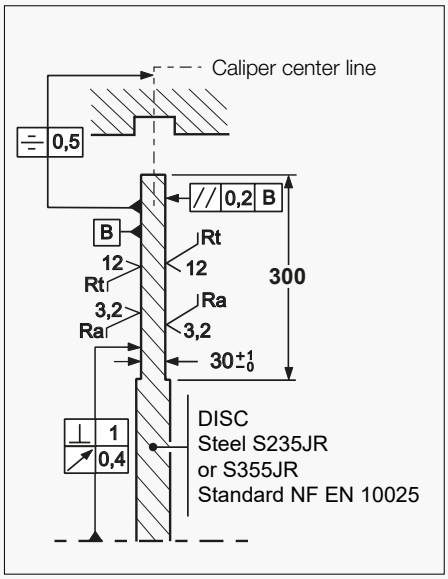
Emergency Brakes

DISC BRAKE - SHC32-SHPU2 CALIPER

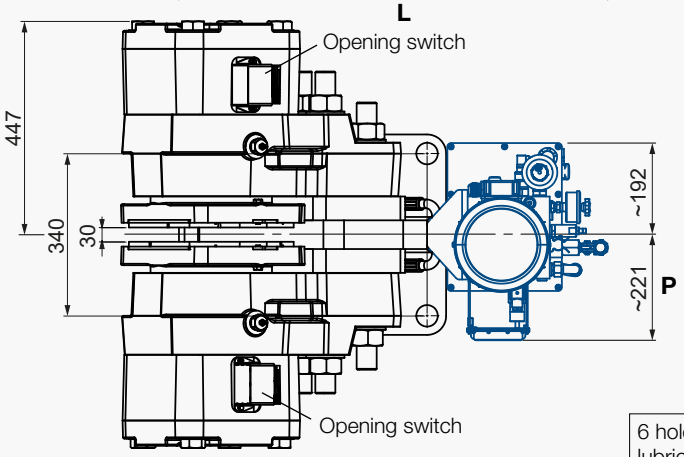
Revision number: T10195-01-A **Revision date: 08.12.2021**

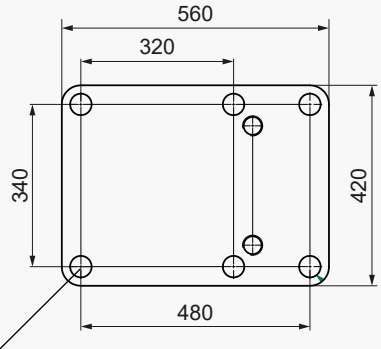
- Caliper mounted on a support
- SHPU2 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear indicator wires
- See technical data in SH32 leaflet
- Weight = 2250 kg
- Dimensions with electrical control unit:
  K-TB or **K-BA**: **L**≈899, **H**≈829, **P**≈294
  K-PR: **L**≈899, **H**≈829, **P**≈284
  K-SI: **L**≈962, **H**≈829, **P**≈367





$$F = \frac{D}{2} \times \cos(30°) - 139.45$$
$$G = \frac{D}{2} \times \sin(30°) + 399.54$$



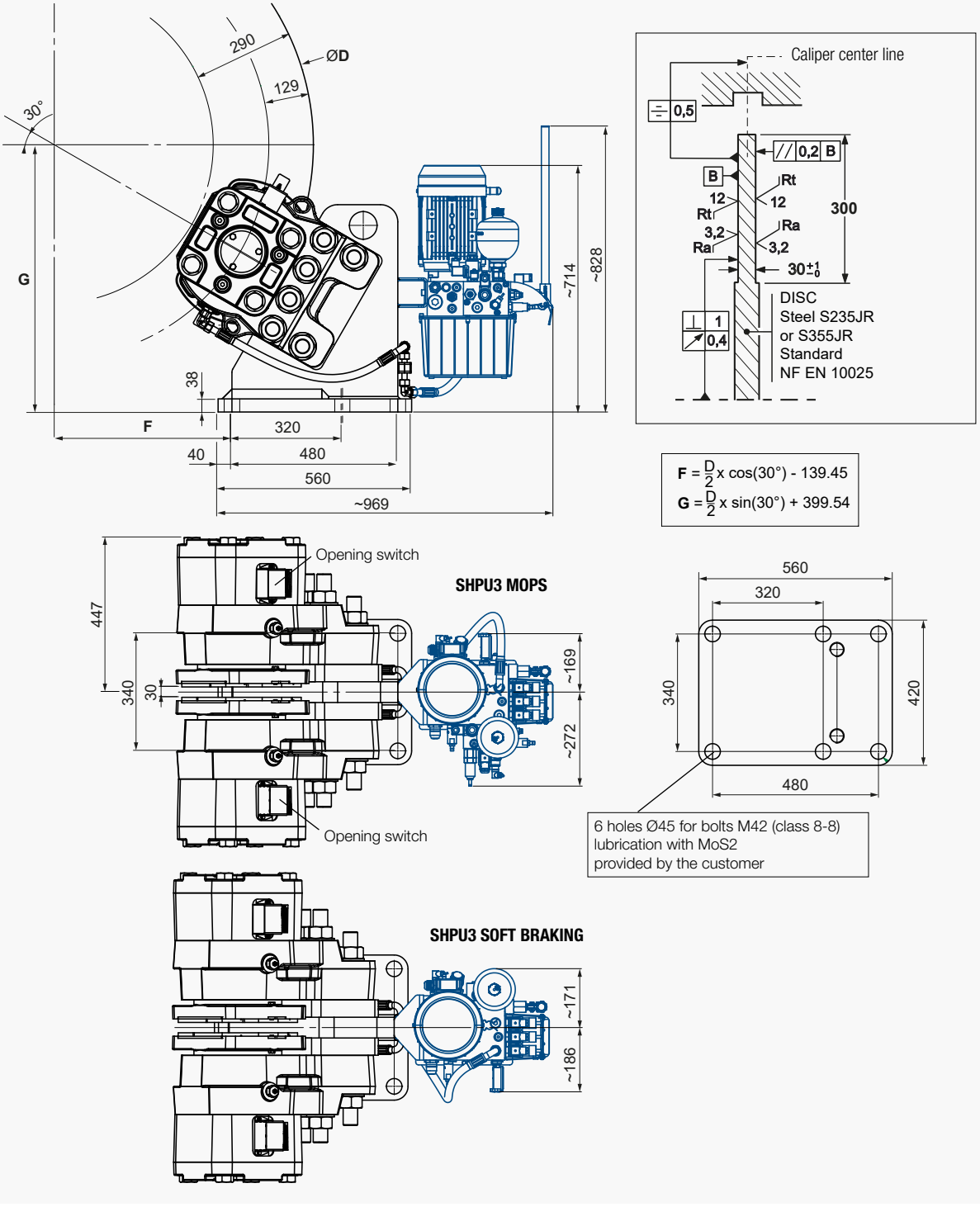


6 holes Ø45 for bolts M42 (class 8-8)
lubrication with MoS2
provided by the customer

DISC BRAKE - SHC32-SHPU3 CALIPER

Revision number: T10195-01-A **Revision date: 08.12.2021**

- Caliper mounted on a support
- SHPU3 (motor 2,2 kW) connected to the caliper
- Opening switches
- Lining wear indicator wires
- Weight = 2263 kg
- Electrical unit: consult us
- See technical data in SH32 leaflet

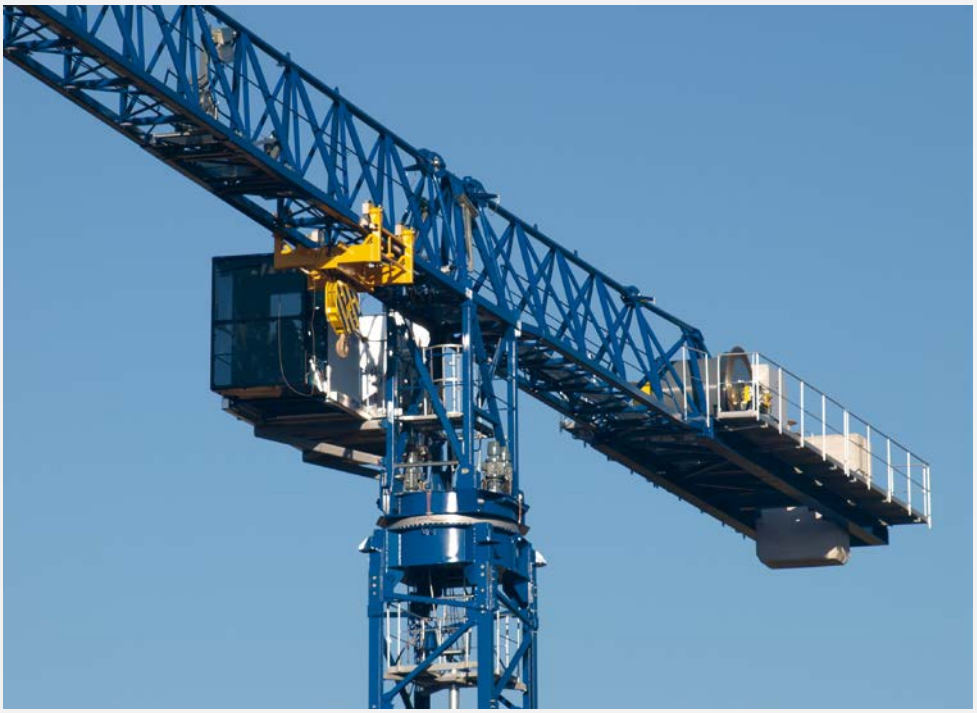


Emergency Brakes

APPLICATIONS

SHD:
- TOWER CRANES - BOOM CRANES
- OFFSHORE APPLICATIONS
- WINDTURBINES

TH/THC9:
- AERONAUTIC APPLICATIONS
- PORT CRANES



HYDRAULIC EMERGENCY BRAKES TYPES SHD / TH

MAIN CHARACTERISTICS	OPTIONS
• FAILSAFE BRAKE BY SPRING APPLICATION. • HYDRAULIC RELEASE • OPENING PROVING SWITCH • LINING WEAR INDICATORS	• LINING WEAR PROVING SWITCH

SHD

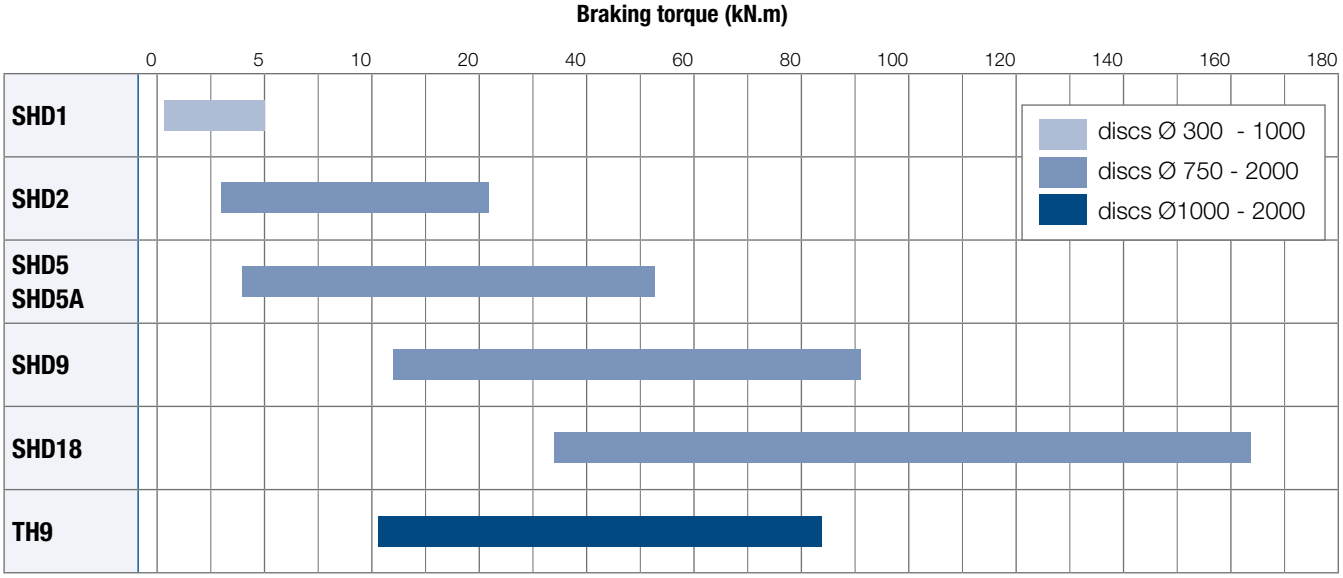
- Single-spring hydraulical caliper
- A large range from SHD1 to SHD18
- Options:
  Automatic lining wear compensation
  Manual release tool - Positive braking
  Integrated HPP - Marine protection

TH9

- Option:
  Disc thickness 42 mm

THC9

- Caliper and Hydraulic Power Pack mounted on the same support
- Option: Electrical unit



Emergency Brakes

DISC BRAKE - SHD1 CALIPER

Revision number: T10098-01-G **Revision date: 16.09.2021**

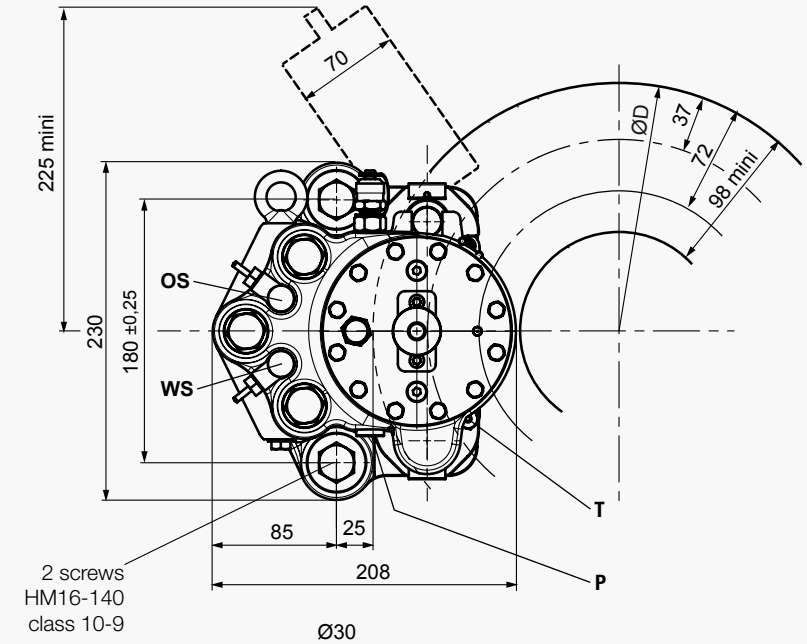
Emergency brake
Fail to safe
Spring application
Hydraulic release
Mechanical holding of the brake in open position for pads changing
Manual wear centering and compensation
Possible association with discs thickness: 12.7 (1/2"), 20 and 30mm.
Lining pads type **US2-1** or **ES3-7**
Lining pads with full wear indicators
Protection C5-M M

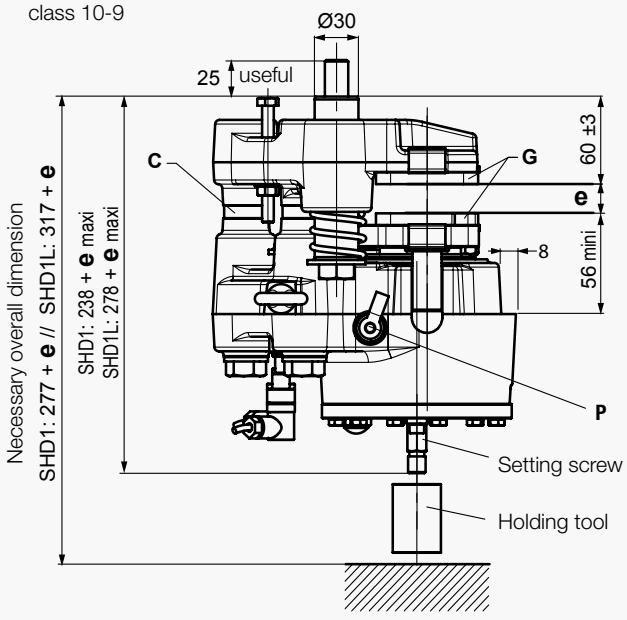
Operating conditions:
- Ambient temperature:
  Dynamic braking: -30°C to +70°C
  Brake applied (parking): -40°C to +70°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µm

Other conditions: consult us.

Use:
- The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, consult us.

Options:
- Opening proving switch (**OS**)
- Lining wear proving switch (**WS**)
- All non-standard disc thickness > 12.7mm (1/2")
- Lining temperature sensor (**T**)
- Mechanical release tool (**DM**)
- **SHD1L**: caliper with manual wear compensation at half wear:
  - braking force before wear = +10% maxi.
  - braking force at half wear = -10% maxi.





C = Spacers according to disc thickness
G = Linings: Thickness of new lining 8 mm
Thickness to wear 6 mm
Each 1 mm of wear on each side: manual centering and compensation
OS = Opening proving switch (option)
WS = Wear proving switch (option)
P = 2 oil ports 1/4"G
Pressure tap delivered separately
T = PT100 sensor (option)
ØD: from 300 to 1000 mm
e = disc thickness

Dimensions in mm
Weight = 24 kg

Electrical data

Inductive switches of opening and wear (options):
3 wires PNP NO
12 to 24 VDC 200mA
with connector M12 / 5 positions
according to standard:
IEC61076-2-101 / code A

Sensor PT100 (option)

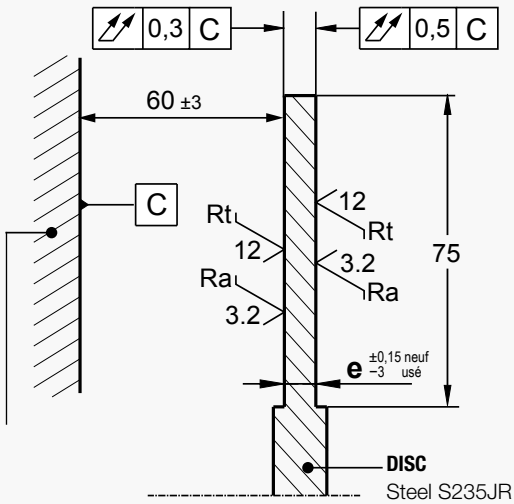
Detection of the temperature threshold:
100°C ± 5
- R = 136.6 Ω at 95 °C
- R = 138.5 Ω at 100°C
- R = 140.4 Ω at 105°C

Cable length = 2.5 meters
2 wires red/yellow

DISC BRAKE - SHD1 CALIPER

Revision number: T10098-01-G **Revision date: 16.09.2021**

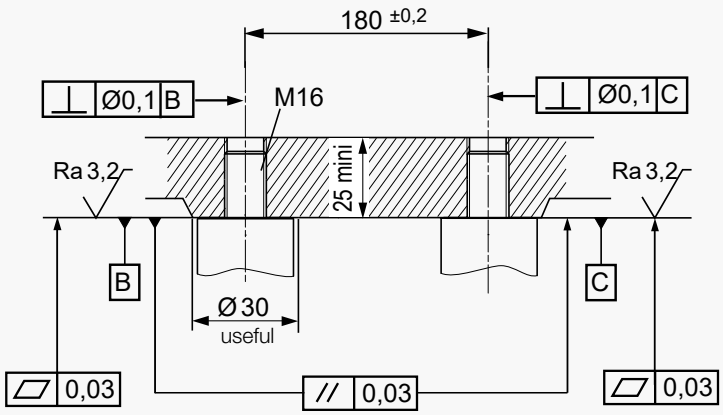
Installation instructions:



Steel S235JR or S355JR
Standard NF EN10025

Standard disc thickness:
e = 12.7 (1/2"), 20 and 30 mm $^{+0.15}_{-3}$
Other thickness, consult us.

Support machining tolerances:



Torque and effort values are subject to a variation of ±10%
Closing time at nominal torque ≤ 0.3s

Designation	Caliper SHD1-		5	4	3	2	1	5	4	3	2	1
	Lining ∗		ES3-7					US2-1				
Braking force BF for air gap disc/lining of 2x1mm	**Dynamic**	N	11 000	8 000	6 000	4 000	2 000	11 000	8 000	6 000	4 000	3 000
	Static	N	9 900	7 200	5 400	3 600	1 800	9 680	7 040	5 280	3 520	2 640
Linear speed of the disc ●		m/s	≤ 50					≤ 10				
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / 300 ≤ D ≤ 1000 mm		N.m	BT = BF (D/2000-0.037)									
Regulation pressure	Minimum Maximum	bar bar	150 170									
Setting pressure limit valve of hydraulic unit		bar	190									
Total volume of oil displaced for air gap disc/lining of:	2 x 1mm (nominal opening)		5 cm³									
	2 x 2mm (wear+opening)	cm³	9 cm³									
	2 x 4mm **SHD1L** (wear+open.)	cm³	18 cm³									

∗ **ES3-7**: disc temperature during one braking ≤ 600°C
US2-1: disc temperature during one braking ≤ 100°C

● For higher speed, consult us.

Emergency Brakes

DISC BRAKE - SHD2 CALIPER

Revision number: T03851-05-B **Revision date: 04.09.2012**

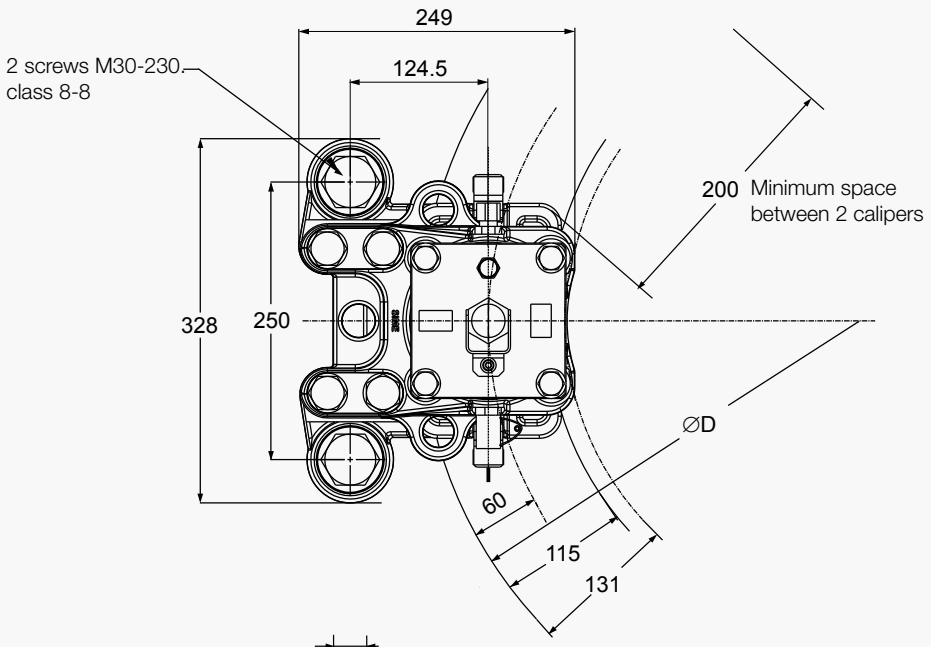
Spring application
Hydraulic release
Opening proving switch (compatible for PLC)
Lining wear proving switch (compatible for PLC)
Marine protection

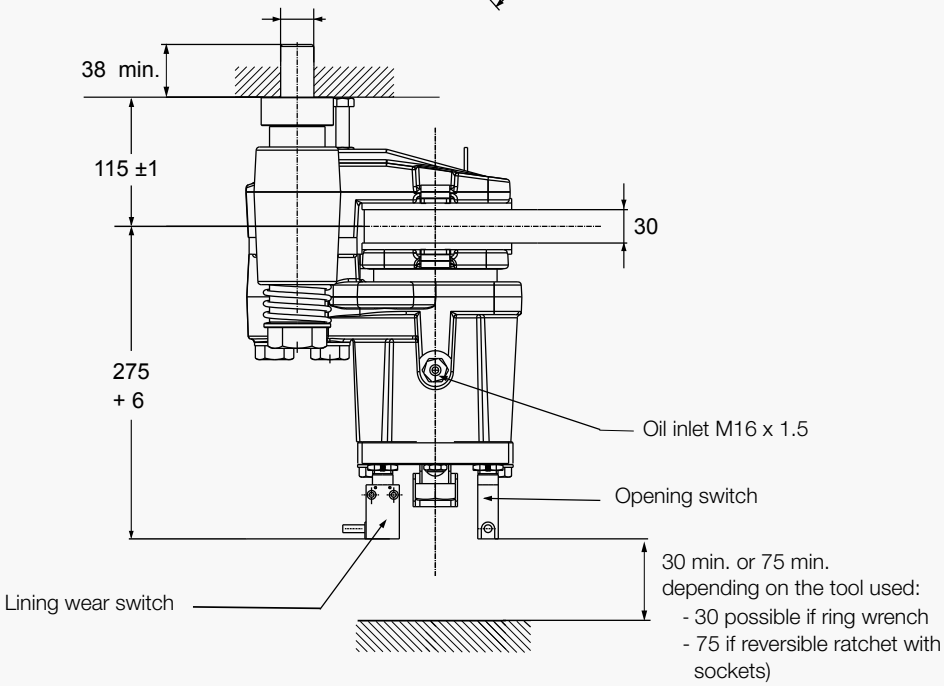
Working conditions:
- Ambient temperature: -20°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

Use:
- Emergency stopping brake in case of overspeed or loss of electrical supply

Options:
- Thermistors for detection of the maximum temperature of the disc





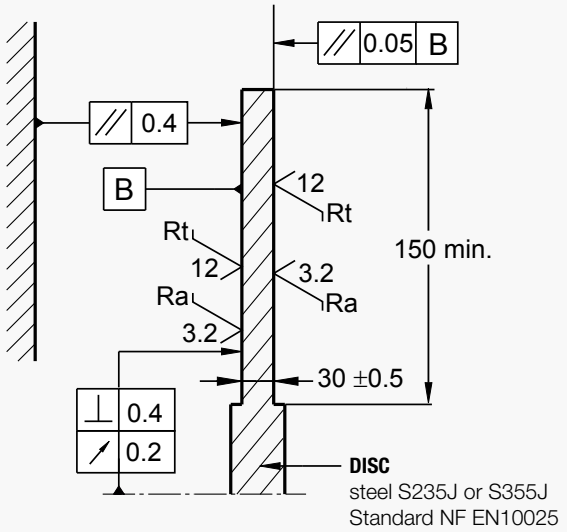
Electrical data:
- Proving switches: 240V. 5A. 50VA AC 220V. 5A. 50W CC

Dimensions in mm
Weight: 60 kg

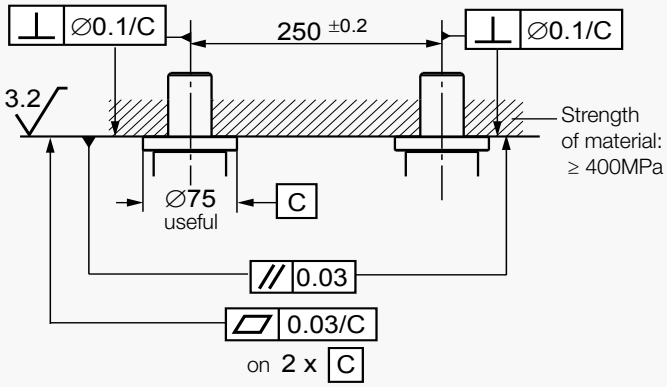
DISC BRAKE - SHD2 CALIPER

Revision number: T03851-05-B **Revision date: 04.09.2012**

Installation instructions:



Support machining tolerances:



Response time at nominal torque < 0.3s
Torque and effort values are subject to a variation of ± 10%

Designation	Caliper		SHD2-3	SHD2-2	SHD2-1
	Lining		ES3-7		
Braking force BF for air gap disc/lining of 2x1mm	**Dynamic**	N	23 000	15 400	10 540
Linear speed of the disc ●		m/s	< 50		
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm)	630 mm	N.m	5 870	3 930	2 690
	710 mm	N.m	6 790	4 540	3 110
	800 mm	N.m	7 820	5 240	3 580
	1000 mm	N.m	10 120	6 780	4 640
		N.m	BT = BF (D/2000 - 0.06)		
Regulation pressure	Minimum	bar	180	110	85
	Maximum	bar	200	140	115
Setting pressure limit valve of hydraulic unit		bar	210	165	140
Total volume of oil displaced		cm^3	8 per stroke (for a nominal disc/lining stroke of 1 mm per side)		
Max. oil volume of the jack		cm^3	45		

● For higher speed, consult us.

Emergency Brakes

DISC BRAKE - SHD5 CALIPER

Revision number: T03861-08-A **Revision date: 29.11.2010**

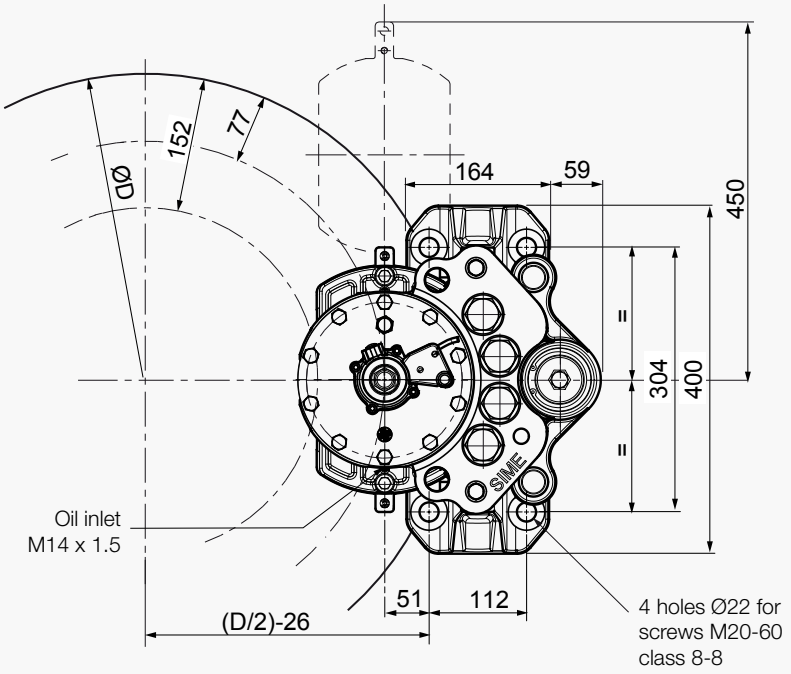
Fail safe braking
Braking by spring application
Hydraulic release
Opening proving switch
Lining wear proving switch

Working conditions:
- Ambient temperature: -20°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

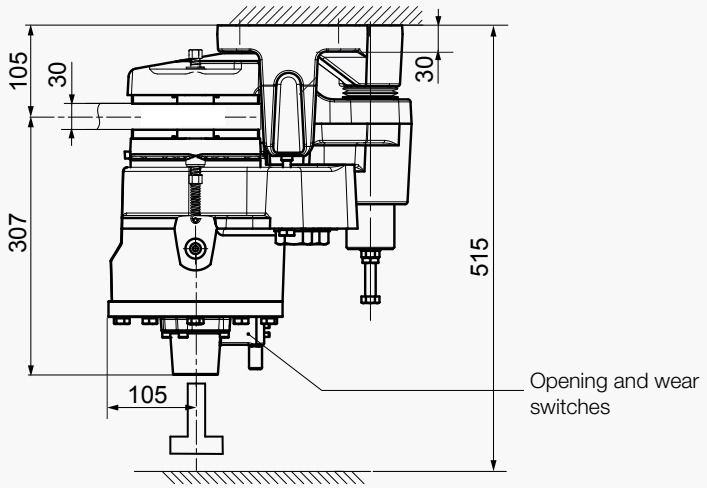
Use:
- Emergency stopping brake in case of overspeed or loss of electrical supply

Options:
- Automatic lining wear compensation (WACS)
- Manual release tool (DM)
- Positive braking
- Detection of full lining wear
- Temperature detection of the linings
- Switch for PLC
- Marine protection



Opening and wear proving switches:
240V. 5A. 50VA AC
220V. 5A. 50W DC
2 m length cable (3 x 0.75 mm²)

Dimensions in mm
Weight: 105 kg

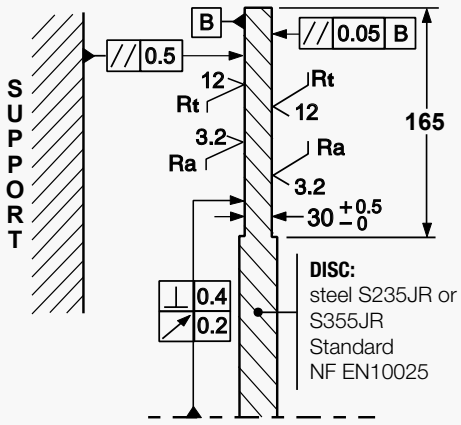


DISC BRAKE - SHD5 CALIPER

Revision number: T03861-08-A **Revision date: 29.11.2010**

Option: Manual release tool DM

Installation instructions:



Torque and effort values are subject to a variation of ±10%
Response time at nominal torque ≤ 0.3s

Designation	Caliper		SHD5-6	SHD5-5	SHD5-4	SHD5-3	SHD5-2	SHD5-1
	Lining		WS1-3					
Braking force BF for 1.25 mm of air gap disc/lining	Dynamic	N	33 000	27 000	23 000	18 000	15 000	13 500
Linear speed of the disc for BF		m/s	< 50					
Dynamic braking torque BT (N.m) for a caliper mounted on a disc ØD (mm)	710 mm	N.m.	9 180	7 500	6 400	5 000	4 170	3 760
	1000 mm	N.m.	13 960	11 420	9 730	7 610	6 350	5 720
	1500 mm	N.m.	22 210	18 170	15 480	12 110	10 100	9 090
		N.m	BT = BF (D/2000 - 0.077)					
Regulation pressure	Min.	bar	110	110	85	60	60	60
	Max.	bar	140	140	115	80	80	80
Setting pressure limit valve hydraul. pack		bar	165	165	140	105	105	105
Total volume of oil displaced		cm^3	15.9 per stroke (for nominal disc/lining stroke of 1.25 mm per side)					
Max. oil volume of the jack		cm^3	76					

Emergency Brakes

DISC BRAKE - SHD5A-M2 CALIPER

Revision number: T10131-02-E **Revision date: 27.09.2018**

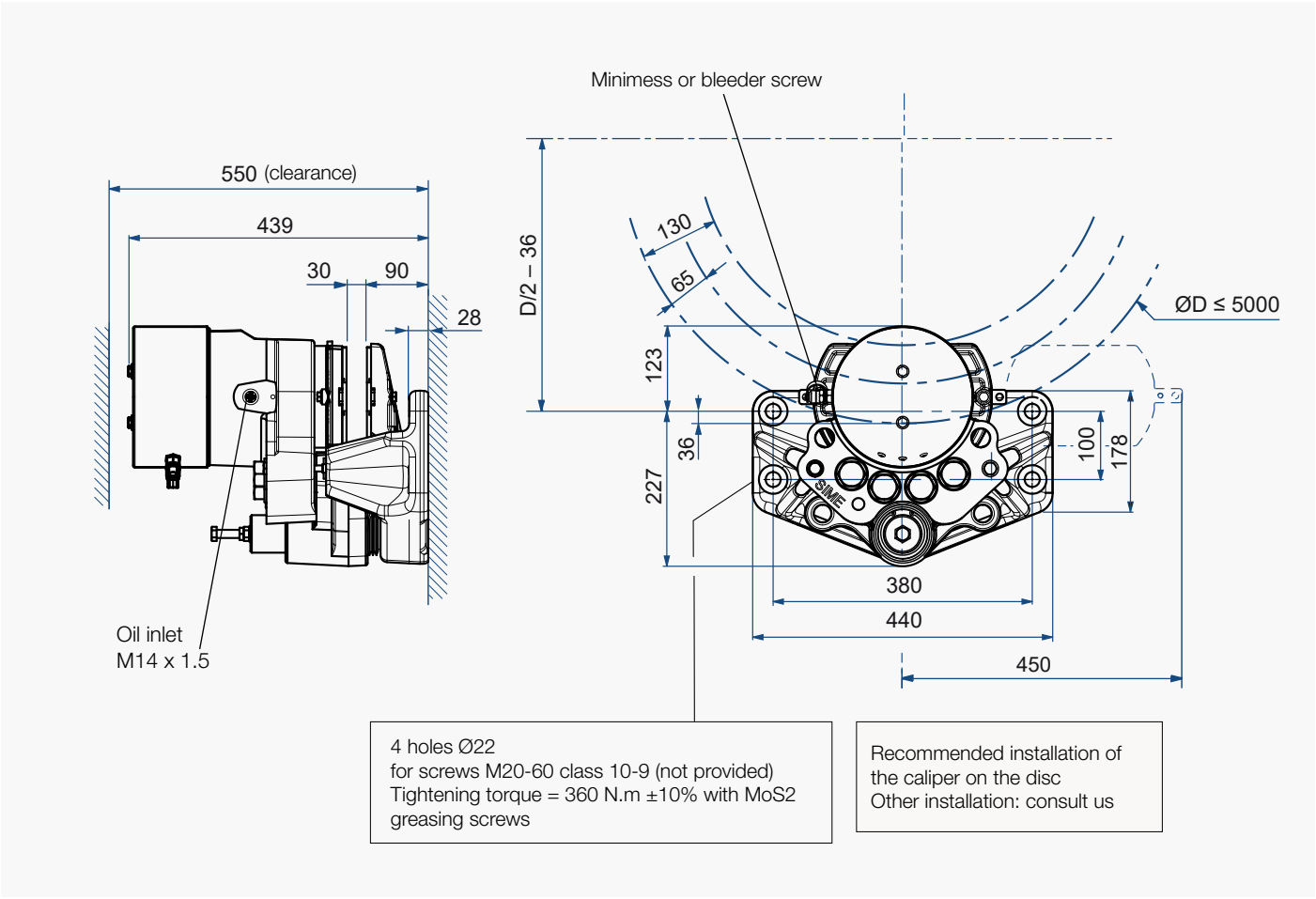
Fail safe braking
Braking by spring application
Hydraulic release
Opening proximity switch
Holding tool
Detection of full lining wear
Protection level C3-H standard ISO 12944-2
VCI packing

Working conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions. consult us.

Use:
- Emergency stopping brake in case of overspeed or loss of electrical supply
- Service life: 200 000 cycles

Options:
- Wear proximity switch
- Closing proximity switch
- Low temperature:
  - dynamic braking: -30°C to +60°C
  - brake closed (park position): -40°C to +60°C
- Protection level C5M-H

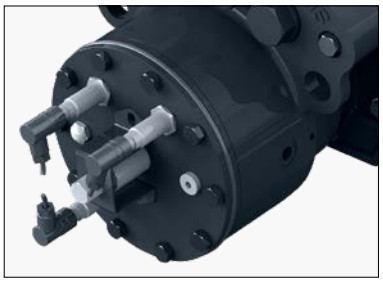


Electrical data:

Opening proximity switch:

3 wires PNP NO
10 to 58 VDC 200 mA
delivered with connector M12

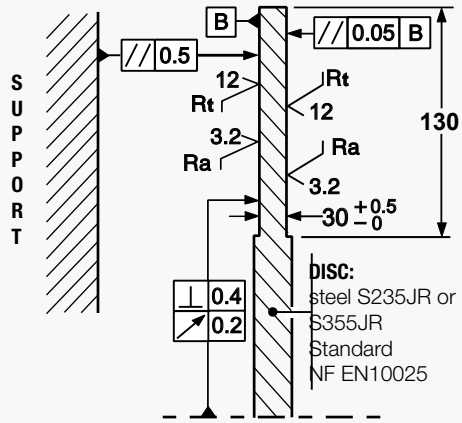
Closing and wear switches: optional



DISC BRAKE - SHD5A-M2 CALIPER

Revision number: T10131-02-E **Revision date: 27.09.2018**

Installation instructions:



Torque and effort values are subject to a variation of ±10%
Response time at nominal torque ≤ 0.3s

Designation	Caliper SHD5A-...-M2		1	2	3	4	5	6	7	8
	Lining		US2-1							
Braking force BF for 1 mm of air gap disc/lining	Dynamic	N	15500	17700	20000	28000	33000	41000	48000	56000
	Static	N	13650	15600	17600	24650	29050	36100	42250	49300
Linear speed of the disc for BF		m/s	< 10							
Dynamic braking torque BT for a caliper mounted on a disc ØD (mm) Dmax.=1500 mm		N.m	BT = BF (D/2000 - 0.065)							
Regulation pressure	Min.	bar	60	60	85	85	110	140	140	180
	Max.	bar	80	80	115	115	140	160	160	200
Setting pressure limit valve hydraulic pack		bar	105	105	140	140	165	190	190	225
Total volume of oil displaced		cm^3	12.7 per stroke (for nominal disc/lining stroke of 1 mm per side)							
Max. oil volume of the jack		cm^3	76							

Emergency Brakes

DISC BRAKE - SHD9 CALIPER

Revision number: T10042-01-E **Revision date: 31.08.2017**

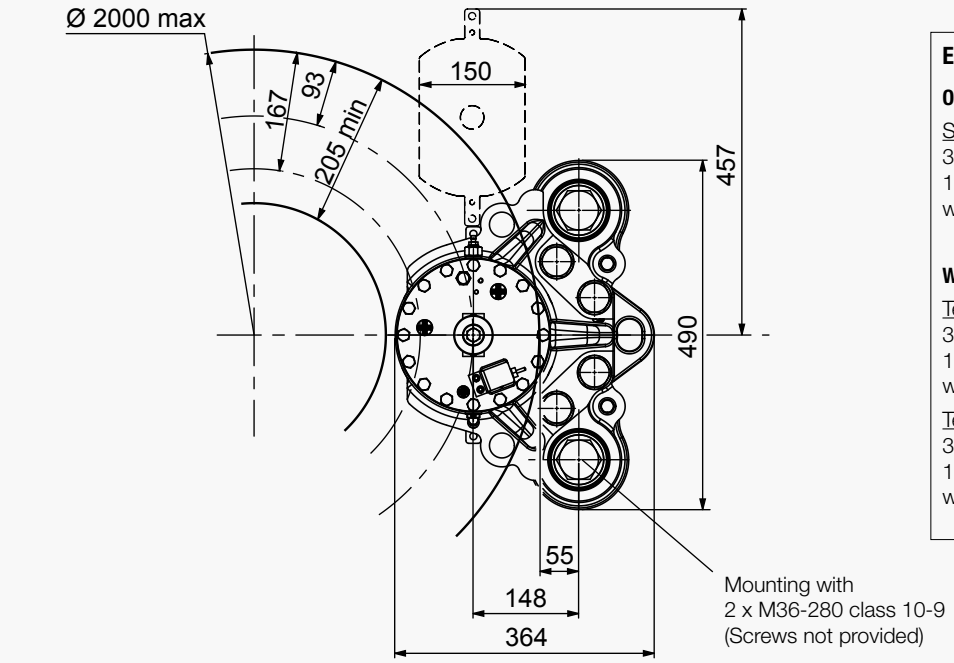
Fail safe braking
Braking by spring application
Hydraulic release
Opening proximity switch for PLC
(induction sensor)
Lining wear detectors
Association with discs thichness 30 mm

Working conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µm

Other conditions, consult us.

Use:
- Emergency stopping brake in case of overspeed or loss of electrical supply

Option:
- Lining wear proximity switch
- Discs thickness 24 ≤ **e** < 30 mm.
- Option GF:
  Ambient temperature:
  - Dynamic braking: -30°C to +60°C
  - Parking braking: -40°C to +60°C
- Marine protection



Electrical data:

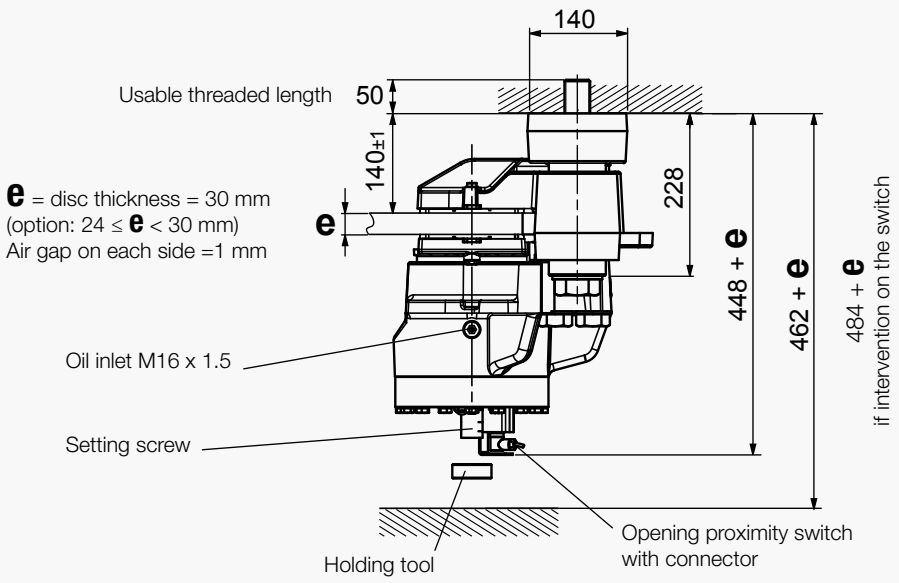
Opening proximity switch

Standard caliper and caliper option GF
3 wires PNP NO
10 to 58 VDC 200 mA
with connector M12

Wear proximity switch (option):

Temperature -10°C to +60°C
3 wires PNP NO
10 to 58 VDC 200 mA
with connector M12

Temperature -40°C to +60°C / Option GF
3 wires PNP NO
10 to 36 VDC 200 mA
with connector M12

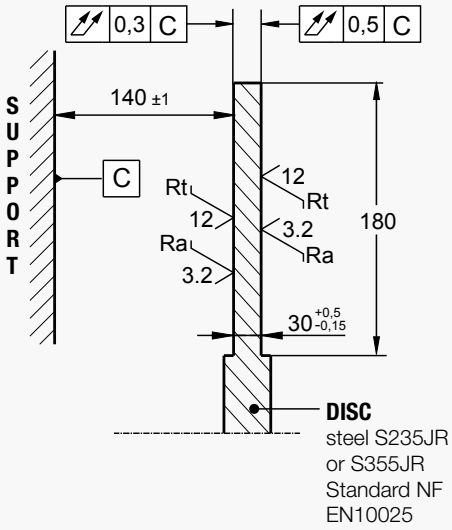


Weight: 148 kg
Dimensions in mm

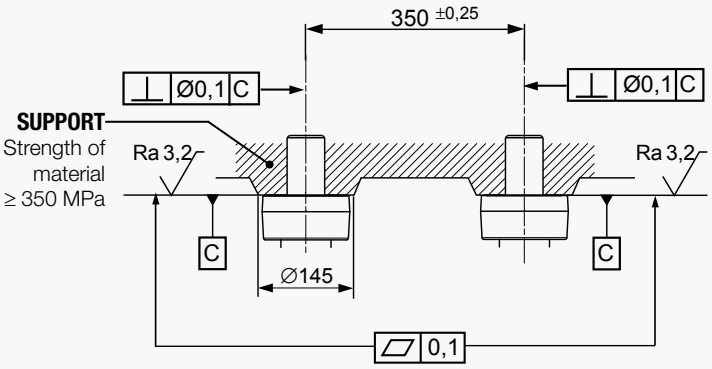
DISC BRAKE - SHD9 CALIPER

Revision number: T10042-01-E **Revision date: 31.08.2017**

Installation instructions:



Support machining tolerances:



Torque and effort values are subject to a variation of ±10%
Response time at nominal torque ≤ 0.3s

Designation	Caliper		SHD9-6		SHD9-5		SHD9-4		SHD9-3		SHD9-2		SHD9-1	
	Lining ✳		US2-1	US2-5	US2-1	US2-5	US2-1	US2-5	US2-1	US2-5	US2-1	US2-5	US2-1	US2-5
Braking force BF for air gap disc/lining of 2x1mm	**Dynamic**	N	100 000	87 000	90 000	78 300	80 000	69 600	70 000	61 000	60 000	52 300	50 000	43 500
	Static	N	88 000	78 300	79 200	70 500	70 400	62 600	61 600	54 900	52 800	47 000	44 000	39 100
Linear speed of the disc		m/s	≤ 10											
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / D max ≤ 2000mm		N.m	BT = BF (D/2000 - 0.093)											
Regulation pressure	Minimum Maximum	bar bar	180 200		170 190		150 170		120 140		110 130		90 110	
Setting pressure limit valve of hydraulic pack		bar	220		210		190		160		160		130	
Total volume of oil displaced for air gap disc/lining of:														
2 x 1mm (nominal opening)		cm^3	28											
2 x 1.5mm (nominal opening and wear before setting)		cm^3	39											

✳ **US2-1**: disc temperature during one braking ≤ 150°C
US2-5: disc temperature during one braking ≤ 350°C.

Emergency Brakes

DISC BRAKE - SHD18 CALIPER soon available

Revision number: T10129-01-B **Revision date: 29.06.2022**

Fail safe braking
Braking by spring application
Hydraulic release
Opening and lining pre-wear detection device
Full lining wear indicators
Association with discs thichness 30 mm
Protection level C3 L standard NF ISO9223

Working conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 70µm

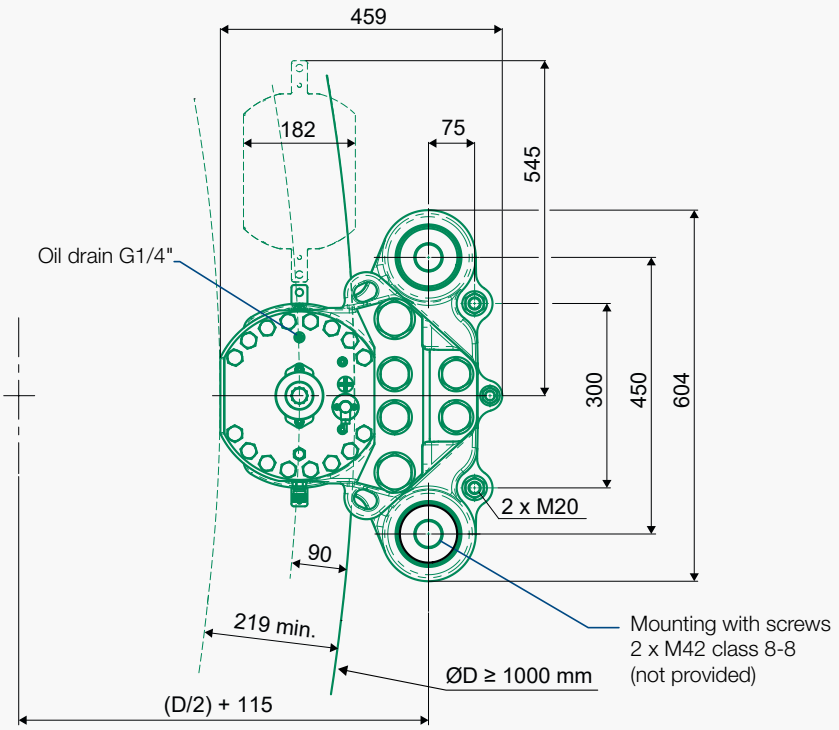
Other conditions, consult us.

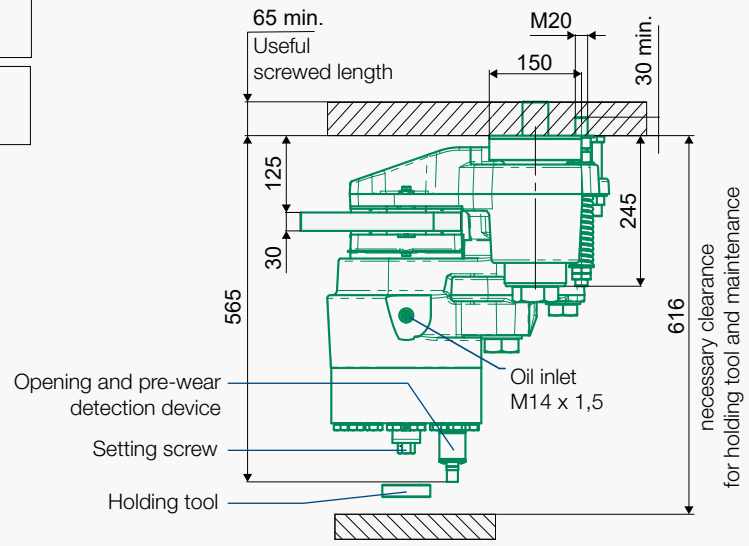
Use:
- Emergency stopping brake in case of overspeed or loss of electrical supply

Option:
- Opening and wear inductive switches
- Protection level C5-M M standard NF ISO9223
- **SHDC18**: Caliper with Hydraulic Power Pack on the same support
- **SHDF18**: Floating caliper, consult us

Opening and pre-wear detection device:
Rated current: 0,1A to 6A
Nominal voltage: 80VDC to 250VAC
with connector M12 according to IEC61076-2-101 standard

Dimensions in mm
Weight: 306,5 kg

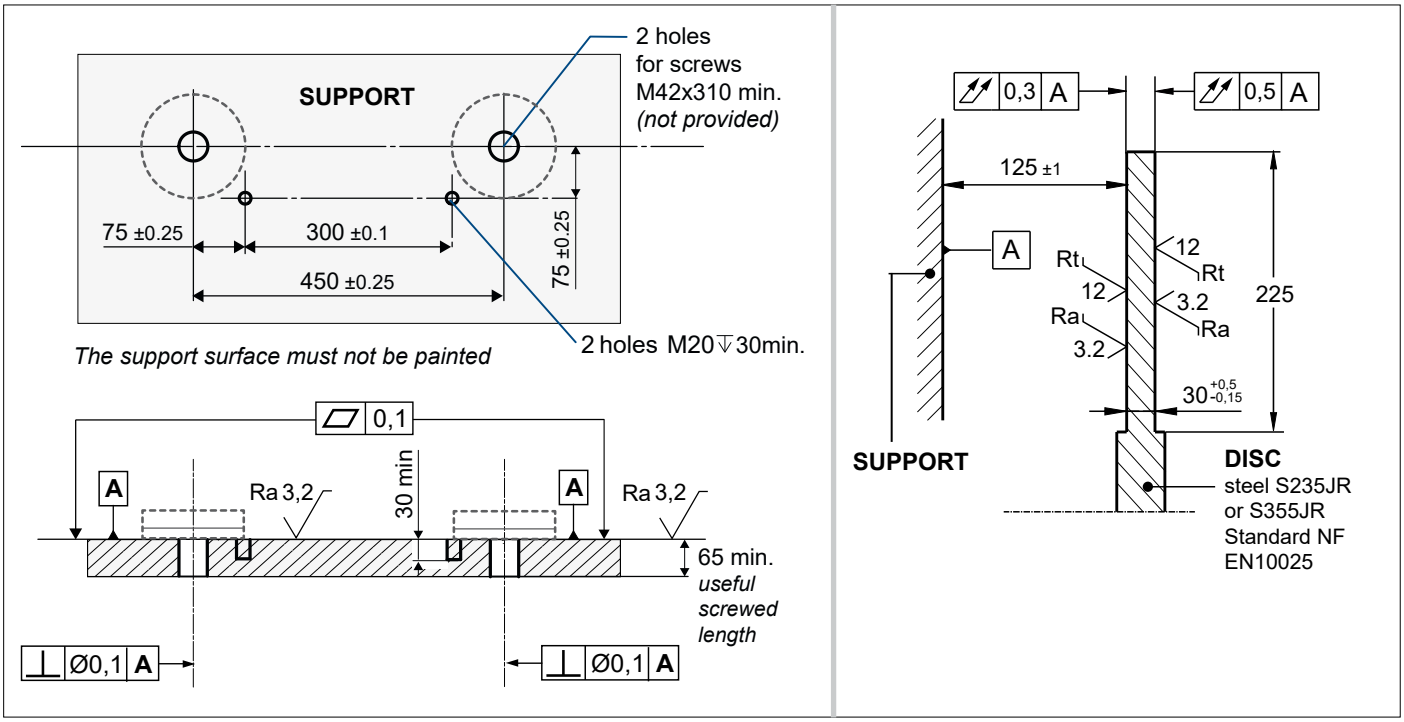




DISC BRAKE - SHD18 CALIPER soon available

Revision number: T10129-01-B **Revision date: 29.06.2022**

Installation instructions:



Torque and effort values are subject to a variation of ±10%
Response time at nominal torque ≤ 0.3s

Designation	Caliper		SHD18-3	SHD18-2	SHD18-1
	Lining		US2-1		
Braking force BF for air gap disc/ lining of 2x1mm	Dynamic	N	180 000	150 000	120 000
	Static	N	162 000	135 000	108 000
Linear speed of the disc		m/s	≤ 10		
Dynamic braking torque BT (m.N) for 1 caliper and disc ØD (mm) / 1000mm ≤ D ≤ 2000mm		N.m	BT = BF (D/2000 - 0,09)		
Regulation pressure	Minimum Maximum	bar bar	195 205	160 170	130 140
Setting pressure limit valve of hydraulic unit		bar	225	190	160
Total volume of oil displaced for air gap disc/lining of:					
2 x 1 mm (nominal opening)		cm^3	48		
2 x 2 mm (nominal opening + wear before setting)		cm^3	82		

✳ **US2-1:** disc temperature during one braking ≤ 150°C

Emergency Brakes

DISC BRAKE - TH9 CALIPER

Revision number: T03830-01-C **Revision date: 13.12.2010**

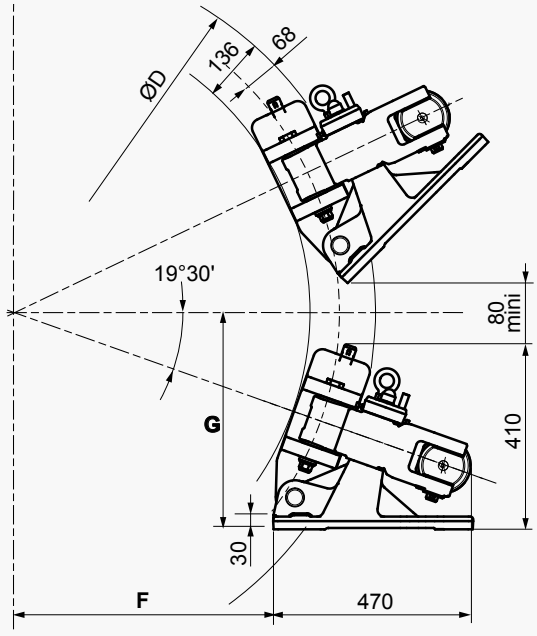
Fail safe
Spring applied
Hydraulic release (mineral oil)
Opening proving switch
Wear proving switch
Lining wear detector

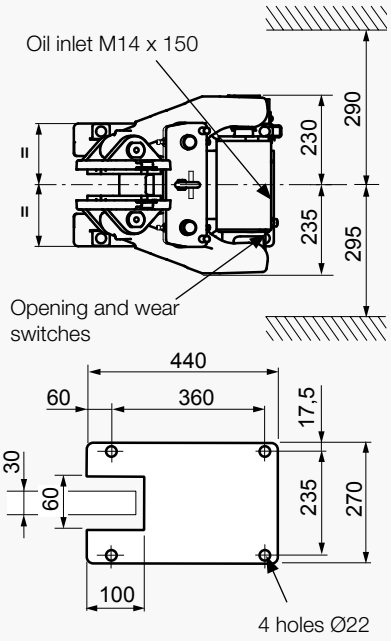
Working:
- Ambient temperature: -10°C to +60°C
- Relative humidity ≤ 70%
- Dust in atmosphere ≥ 65µ

Other conditions, consult us.

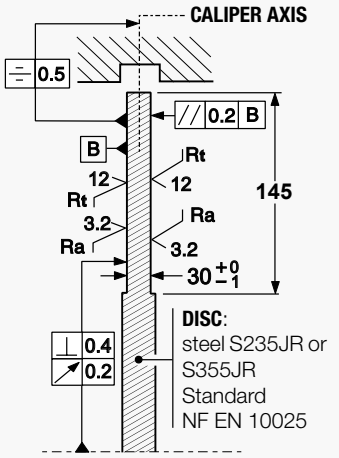
Use:
Service brake to operate with full or variable torque
Emergency brake in case of overspeed or loss of electrical supply

Option:
Disc thickness 42 mm





Installation instructions



Weight: 140 kg
Dimensions in mm

Designation	Caliper		TH9-3		TH9-2		TH9-1	
	Lining ✳		US2-1	WS1-3	US2-1	WS1-3	US2-1	WS1-3
Braking force BF for 1mm of air gap disc/lining	Static N		81 000	54 000	52 650	38970	28 350	22 140
	Dynamic N		90 000	60 000	58 500	43 300	31 500	24 600
Linear speed of the disc		m/s	≤10	≤50	≤10	≤50	≤10	≤50
Dynamic braking torque BT (N.m) for 1 caliper and a disc ØD (mm)	1000 mm	Nm	38 880	25 920	25 270	18 700	13 600	10 620
	1200 mm	Nm	47 880	31 920	31 120	23 030	16 750	13 080
	1500 mm	Nm	61 380	40 920	39 890	29 530	21 480	16 770
	2000 mm	Nm	83 880	55 920	54 520	40 350	29 350	22 920
BT for other ØD (mm)		Nm	BT = BF (D/2000 - 0.068)					
Positioning when D<3000mm Above it. consult us	F	mm	(0.4713 x D) - 172					
	G	mm	(0.1669 x D) + 212					
Regulation pressure	minimum	bar	140		85		60	
	maximum	bar	160		115		80	
Setting pressure limit valve of hydr. unit		bar	190		140		105	
Total volume of oil displaced		cm^3	58 for one stroke disc/lining (nominal wear and opening)					

Torque and force values are subject to a variation of ±10%.

Response time at nominal torque : see leaflet n° G08555-01.

Opening and wear switches:

250VAC maxi., 5A maxi.,
with interrupting capacity: 50VA maxi.

220VDC maxi., 5A maxi.,
with interrupting capacity: 50W maxi.

Compatible with PLC
(Programmable Logic Controllers).
A switch used with other equipment than PLC must not be reused with a PLC.

✳ **US2-1**: disc temperature during one braking ≤ 150°C
WS1-3: disc temperature during one braking ≤ 600°C
US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

DISC BRAKE - THC9B CALIPER

Revision number: T03836-01-C **Revision date: 24.08.2012**

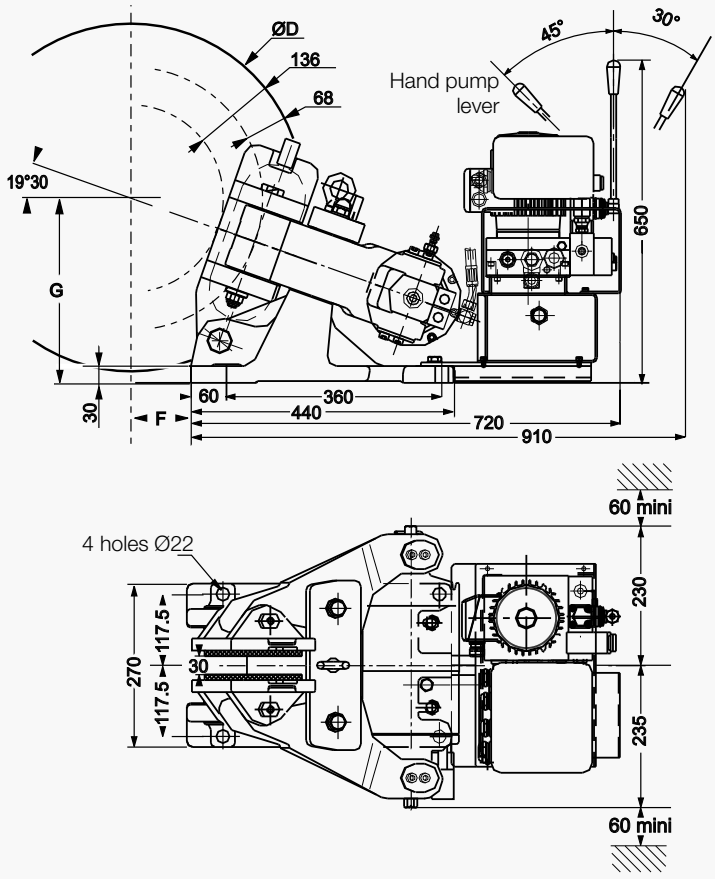
Fail safe
Spring application
Hydraulic release
Integral hydraulic power unit
Self contained electric system
Opening proving switch
Lining wear control switch
Lining wear detector

Operating conditions:
- Ambient temperature: -10°C to +60°C
- Relative humidity: ≤ 70%
- Dust in atmosphere ≥ 65µ

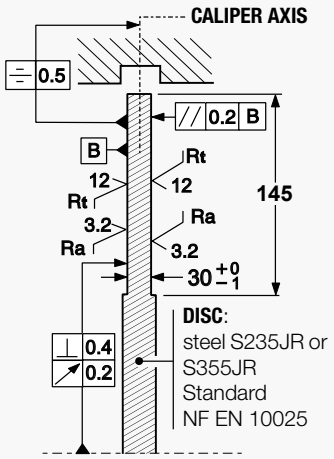
Other conditions, please contact us.

Use:
The brake should be applied only in case of emergency stop, overspeed or shutdown of electric mains. Other use, please contact us.

Options:
- Progressive braking system
- Disc thickness 42 mm



Installation instructions



Permissible inclination of the caliper:
±15° maximum regarding the horizontal.
For other mounting, please contact us.

Weight: 180 kg
Dimensions in mm

Designation	Caliper		TH9-3		TH9-2		TH9-1	
	Lining ✳		US2-1	WS1-3	US2-1	WS1-3	US2-1	WS1-3
Braking force BF for 1mm of air gap disc/lining	Static	N	81 000	54 000	52 650	38 970	28 350	22 140
	Dynamic	N	90 000	60 000	58 500	43 300	31 500	24 600
Linear speed of the disc		m/s	≤10	≤50	≤10	≤50	≤10	≤50
Dynamic braking torque BT (N.m) for 1 caliper and a disc ØD (mm)	1000 mm	Nm	38 880	25 920	25 270	18 700	13 600	10 620
	1200 mm	Nm	47 880	31 920	31 120	23 030	16 750	13 080
	1500 mm	Nm	61 380	40 920	39 890	29 530	21 480	16 770
	2000 mm	Nm	83 880	55 920	54 520	40 350	29 350	22 920
BT for other ØD (mm)		Nm	BT = BF (D/2000 - 0.068)					
Positioning when D<3000mm Above it. consult us	F	mm	(0.4713 x D) - 172					
	G	mm	(0.1669 x D) + 212					
Setting pressure limit valve of hydr. pack		bar	190		140		105	

✳ **US2-1**: disc temperature during one braking ≤ 150°C
WS1-3: disc temperature during one braking ≤ 600°C
US2-5: disc temperature during one braking ≤ 350°C, optional, consult us.

Electrical data:

HPP motor: 3 phases: 230/400V ±10%
50Hz 0.37kW, 4 poles
for mains: 230/400 V 50 Hz
or 415 V 50 Hz or 460 V 60 Hz

Motor option: 400/690V ±10% 50Hz
255/440V ±10% 50Hz
290/500V ±10% 50Hz
280/480V ±10% 60Hz
330/575V ±10% 60Hz
Other voltage, please contact us.
Electrical casing IP55

Opening and wear proving switches:
U mini 24V AC or DC
U maxi 250V AC ou 220 V DC
I mini 0.1A AC or DC
I maxi 5A AC or DC
interrupting capacity:
mini:2.4VA AC or 2.4W DC
maxi: 50VA (AC) ou 50W (DC)

ELECTRICAL POWER UNITS

Electrical Power Uniits

MAIN CHARACTERISTICS

- DESIGNED TO GIVE OPTIMUM PERFORMANCE FROM THE ELECTROMAGNETIC CALIPERS
- AC LINE SUPPLY: AB8, AC64, AC32, AS100, 4200 AND 4205
- DC LINE SUPPLY: DC64, DC32 AND DS100
- HIGH "CALL" VOLTAGE TO REDUCE OPENING RESPONSE TIME
- AUTOMATIC REDUCTION TO AN ECONOMICAL "HOLD" VOLTAGE
- A "CUT-OUT" CIRCUIT GIVING A VERY SHORT BRAKE ACTION

AC64 & AC32

- Simplicity of adjustment and use.
- Weights and size reduced.
- Quick diagnosis of fault through the use of 6 LEDS.
- Standard mains: 230/500 VAC, 115/220 VDC

AS100

- Other mains: 115 VAC, 500/700 VAC, 24 VDC et 48 VDC
- Available in:
  - Polycabornate enclosure (CP): IP66, IK8
  - or Steel enclosure (CA): IP66, IK9

4200 & 4205 / AB8

- **4205** unit enables electrically controlled lowering.
- **AB8** unit is used with "E" series calipers for progressive braking torque control.

POWER UNITS	CALIPERS											
	660	650	650E	645 - 45K	5D - 5DR	5DE	4CA2	3CA2	2CA2 - 1CA2	OSA	OOSA	2SA
AC64 - DC64	■	■	■	■	■	■	■					
AC32 - DC32							■	■	■			
AS100 - DS100										■	■	
4200							■	■		■	■	■
4205							■	■		■	■	■
AB8			■			■						

Electrical Power Units

ELECTRICAL POWER UNIT - AC64-50 CA

Revision number: T04500-01-E **Revision date: 18.02.2021**

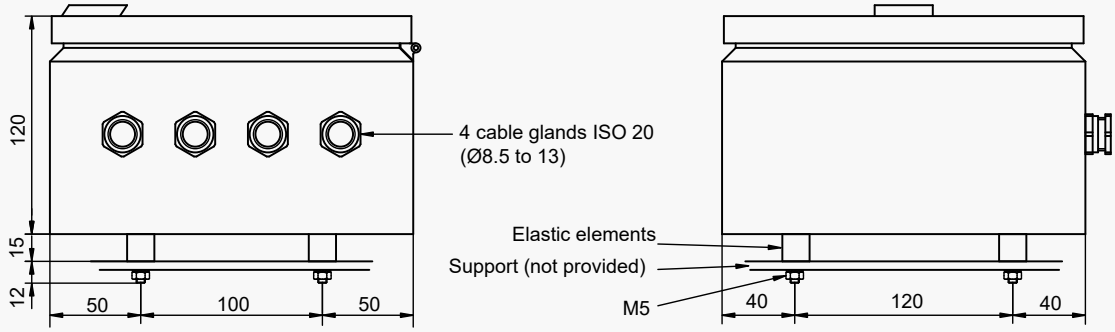
Compact power supply operating on alternating single or two-phase mains.
For SIME Disc Brakes with 50 V coil.
type: 660/650-5K/5D-645-45K-4WD-4CA2
Steel case

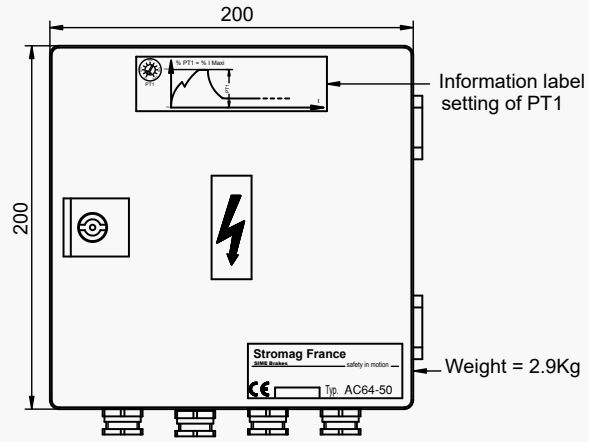
Operating Conditions:
- Casing protection standard IP66 IK09
- Ambient temperature: -20°C to +60°C

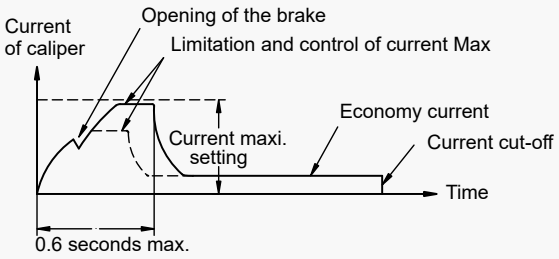
Electrical Data:
Single or two-phase mains AC
230 to 500V AC ± 10% 50/60Hz

EC marking of conformity:
- 2006/95/EC directive BT (standard EN60204-1)
- 2004/108/EC directive CEM
(standards EN61000-6-2 EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Polycarbonate case IP66 IK08







Time of calipers closing (time between mains cut-off and application of 66% of nominal torque).

Caliper	660-5KR-5DR	650-650E 5K-5D-5KE-5DE	645-45K	4WD	4CA2
Tr 66 (ms)	120	100	120	300	240

Caliper			660-650-650E		5K-5D-5KR/DR 5KE-5DE		645		45K		4WD		4CA2
Maximum number of calipers			2		2		2		2		2		1
Resistance at 20°C per caliper		Ω	6.68		6.68		4.52		4.52		4.52		3.08
Maximum number of actuations per hour and ambient temperature θ	θ ≤40°C		150		1000		150		1000		60		1000
	40°C<θ ≤60°C		150		600		150		600		60		600
Mains current absorbed per caliper	Max	A	4		4		6		6		6		9
	Economy	A	0.6		0.6		0.75		0.75		0.75		1
Maximum return resistance of the cable connecting the caliper to the power supply		Ω	2		2		1		1		1		1 ✱
Max. length of the connecting cable (Power supply - caliper) for 1 caliper per cable. depending on cable section	2.5 mm²	m	100		100		50		50		50		50 ✱
	4 mm²	m	160		160		80		80		80		80 ✱
	6 mm²	m	240		240		120		120		120		120 ✱
Protection to be provided in head of control contactor on mains input	Number of caliper		1	2	1	2	1	2	1	2	1	2	1
	Fuse aM	A	1	2	1	2	2	4	2	4	2	4	4
	Circuit-breaker curve C	A	1	2	1	2	2	4	2	4	2	4	4

ELECTRICAL POWER UNIT - AC64-50 CP

Revision number: T04500-01-E **Revision date: 18.02.2021**

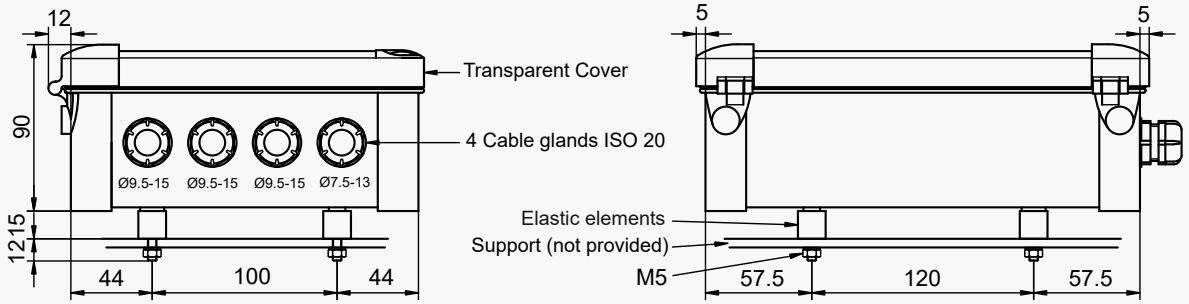
Compact power supply operating on alternating single or two-phase mains.
For S Disc Brakes with 50 V coil.
type: 660/650-5K/5D-645-45K-4WD-4CA2
Polycarbonate case

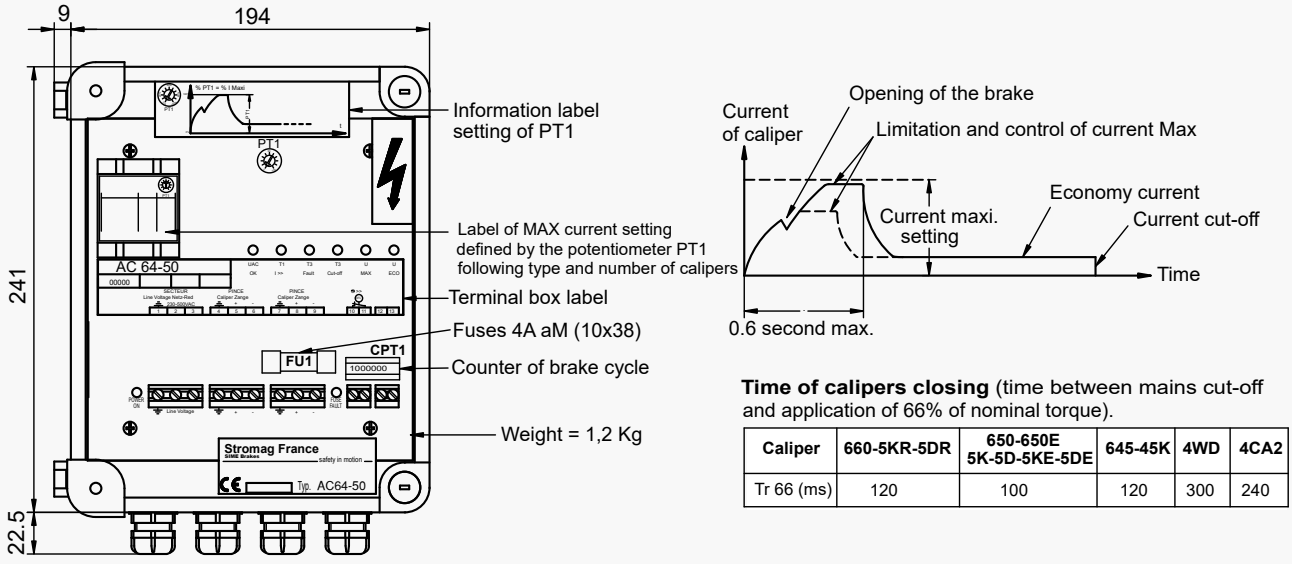
Operating Conditions:
- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

Electrical Data:
Single or two-phase mains AC
230 to 500V AC ± 10% 50/60Hz

EC marking of conformity:
2006/95/EC directive BT (standard EN60204-1)
2004/108/EC directive CEM
(standards EN61000-6-2 EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK09





Time of calipers closing (time between mains cut-off and application of 66% of nominal torque).

Caliper	660-5KR-5DR	650-650E 5K-5D-5KE-5DE	645-45K	4WD	4CA2
Tr 66 (ms)	120	100	120	300	240

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED
Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

✱ If the ambient temperature of the caliper 4CA2 is higher than 60°C, the maximum return resistance and the maximum length of the connecting cable given in the above table must be divided by 2.

Electrical Power Units

ELECTRICAL POWER UNIT - AC32-50 CA

Revision number: T10005-01-F **Revision date: 18.02.2021**

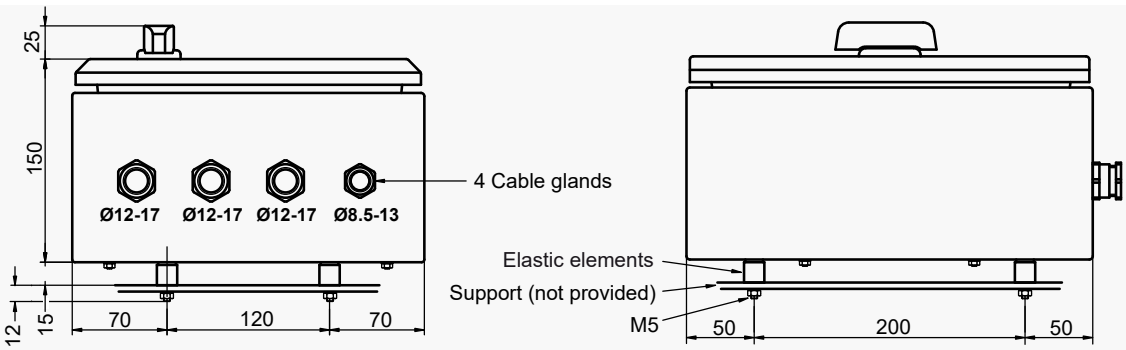
Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 4CA2 - 3WD - 3CA2 - 2CA2 - 1CA2
Steel case

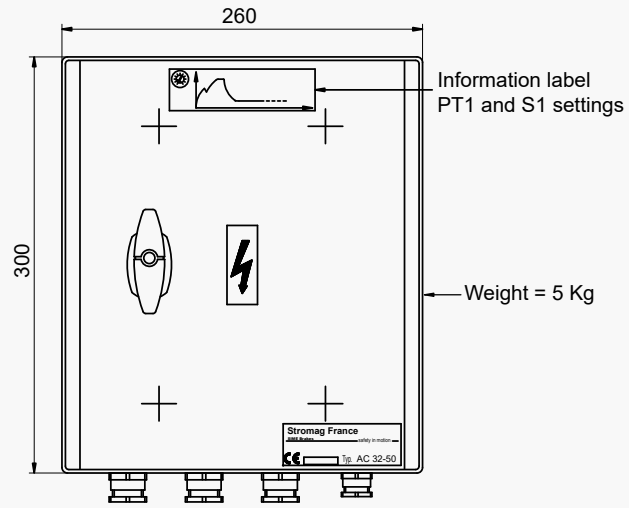
Operating Conditions:
- Casing protection standard IP66 IK10
- Ambient temperature: -20°C to +60°C

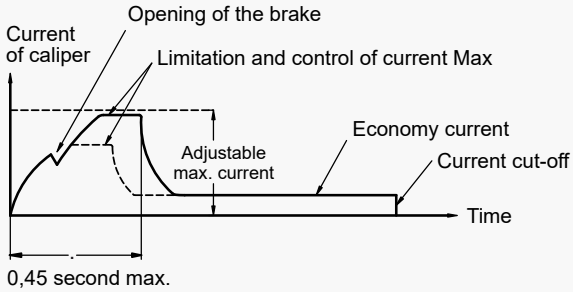
Electrical Data:
Single or two-phase mains AC
230 to 500V AC ± 10% 50/60Hz

EC marking of conformity:
- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Polycarbonate case IP66 IK08







Time of calipers closing between mains cut-off and application of 66% of nominal torque.

Caliper	4CA2	3WD	3CA2	2CA2 - 1CA2
Tr 66 (ms)	240	200	265	190

Caliper			4CA2	3WD	3CA2	2CA2 1CA2	2CA2 + 20% 1CA2 + 20%
Maximum number of calipers			2	1	1	1	
Resistance at 20°C per caliper		Ω	3.08	1.63	1.01	0.75	
Maximum number of actuations per hour and ambient temperature θ	θ ≤40°C		1000	60	1000	1000	600
	40°C<θ ≤60°C		600	60	600	600	300
Mains current absorbed per caliper	Max	A	9	16	20	28.2	
	Economy	A	1	1.5	2	3.3	
Maximum connecting cable return resistance between caliper and supply unit		Ω	1	0.75	1	0.5	
Maximum connecting cable length (caliper-input) according to the cable section	2.5mm²	m	50	35	50	25	
	4mm²	m	80	60	80	40	
	6mm²	m	120	90	120	60	
	10mm²	m	205	155	205	100	
Protection to be provided in head of control contactor on mains input	Fuse aM	A	6	4	6	8	
	Circuit-breaker curve C	A	8	6	10	12	

ELECTRICAL POWER UNIT - AC32-50 CP

Revision number: T10005-01-F **Revision date: 18.02.2021**

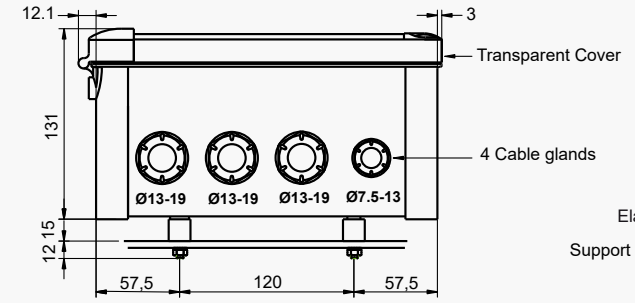
Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 4CA2 - 3WD - 3CA2 - 2CA2 - 1CA2
Polycarbonate case

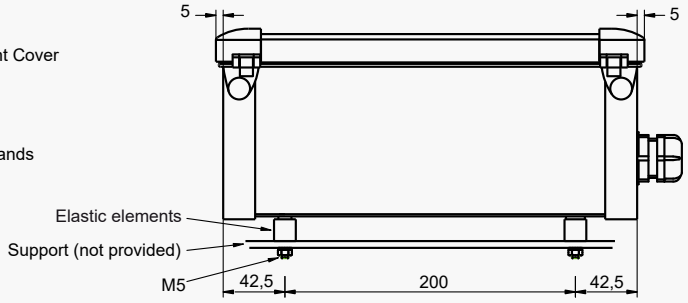
Operating Conditions:
- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

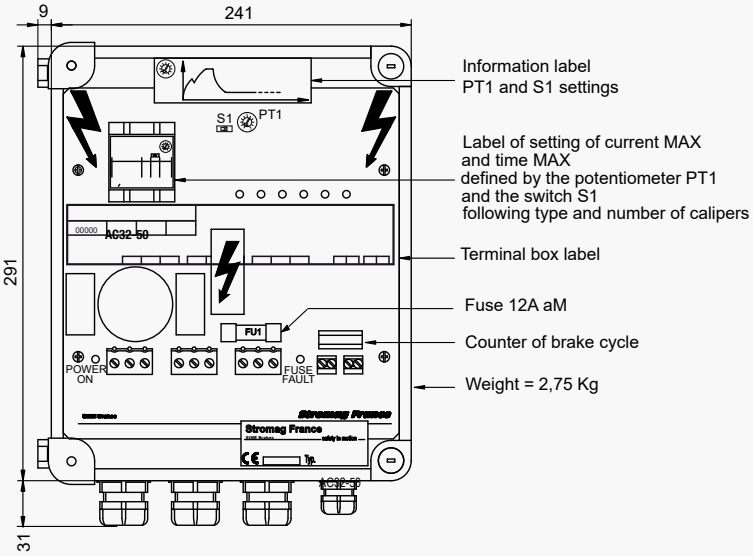
Electrical Data:
Single or two-phase mains AC
230 to 500V AC ± 10% 50/60Hz

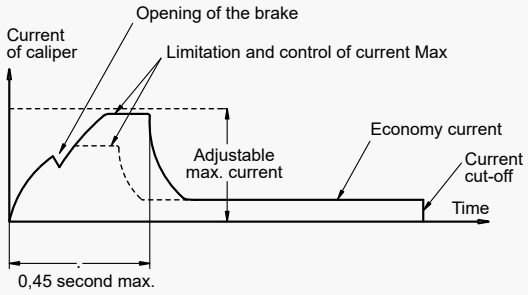
EC marking of conformity:
- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK10









Time of calipers closing between mains cut-off and application of 66% of nominal torque.

Caliper	4CA2	3WD	3CA2	2CA2 - 1CA2
Tr 66 (ms)	240	200	265	190

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED
Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

Electrical Power Units

ELECTRICAL POWER UNIT - AS100-50 CA

Revision number: T10035-02-D **Revision date: 20.03.2020**

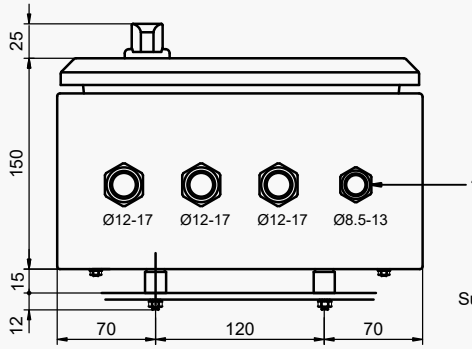
Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 3CA2 - OSA - OOSA
Steel case

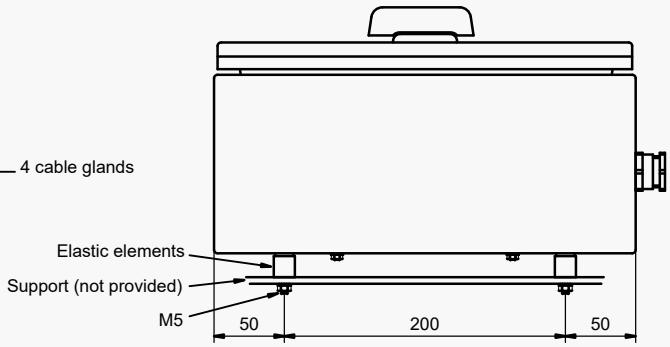
Operating Conditions:
- Casing protection standard IP66 IK10
- Ambient temperature: -20°C to +60°C

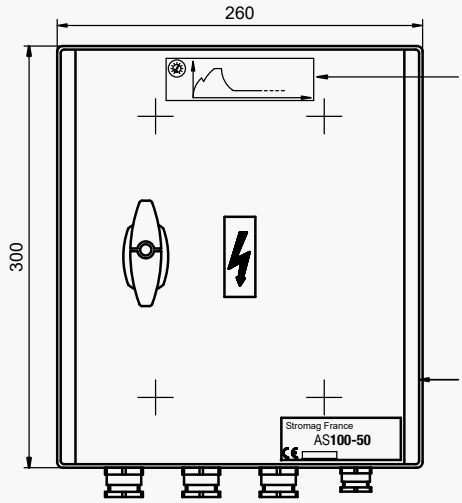
Electrical Data:
Single or two-phase mains AC
230 to 500V AC ± 10% 50/60Hz

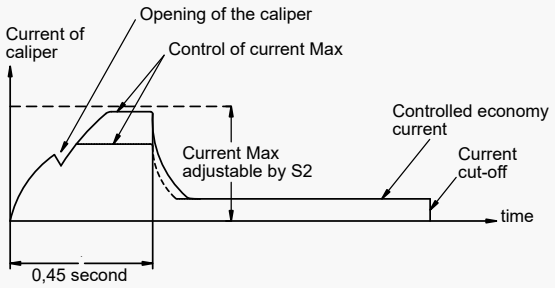
EC marking of conformity:
- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK08









Time of calipers closing between the mains cut-off and the application of 66% of nominal torque.

Caliper	3CA2	0SA	00SA
Tr 66 (ms)	265	150	150

Caliper			3CA2		0SA		00SA
Maximum number of calipers			1	2	1	2	1
Resistance at 20°C per electromagnet		Ω	1.01	1.01	1.01	1.01	1.01
Maximum number of actuations per hour and ambient temperature θ	θ ≤40°C		600	600	100	100	100
	θ ≤60°C		300	300	100	100	100
Mains current absorbed	Max	A	28	36	28	36	36
	Economy	A	3.5	3.6	3.5	3.6	3.6
Maximum connecting cable return resistance between caliper and supply unit		Ω	3.5	1	3.5	1	1
Maximum connecting cable length (caliper input) according to the cable section	2.5 mm²	m	170	50	170	50	50
	4 mm²	m	275	80	275	80	80
	6 mm²	m	415	120	415	120	120
	10 mm²	m	715	205	715	205	205
Protection to be provided in head of control contactor on mains input	Fuse aM	A	6	8	6	8	8
	Circuit-breaker curve C	A	16	16	16	16	16

ELECTRICAL POWER UNIT - AS100-50 CP

Revision number: T10035-01-C **Revision date: 20.03.2020**

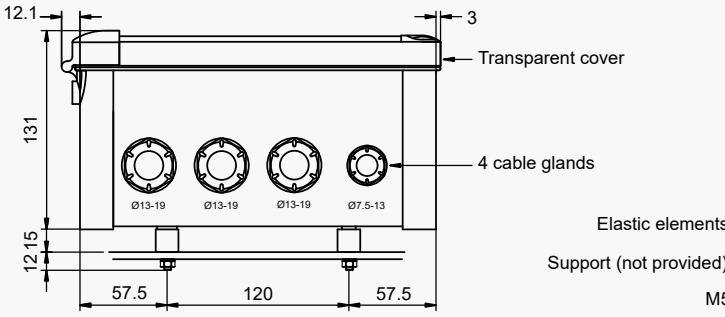
Compact power supply operating on alternating single or two-phase mains.
For SIME disc brakes with 50 V coil.
type: 3CA2 - OSA - OOSA
Polycarbonate case

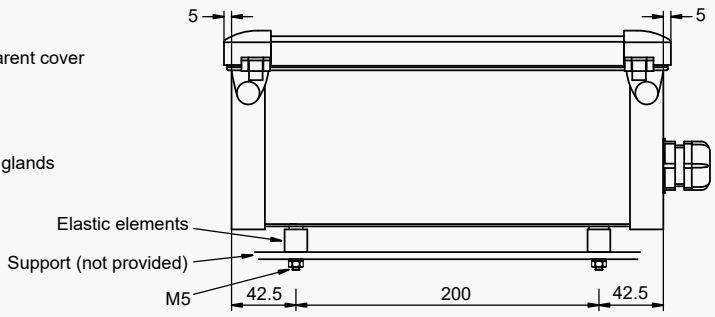
Operating Conditions:
- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

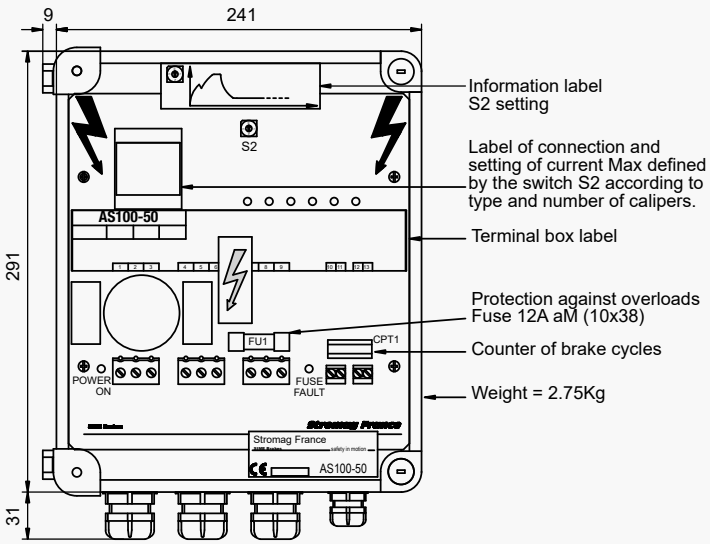
Electrical Data:
Single or two-phase mains AC
230 to 500V AC ± 10% 50/60Hz

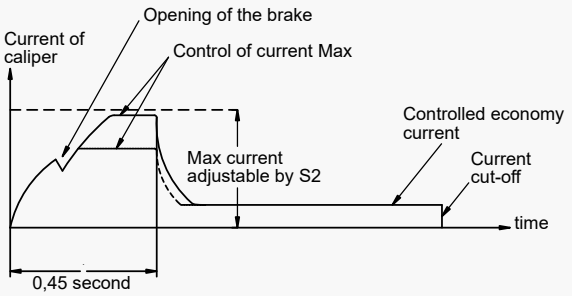
EC marking of conformity:
- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK10









Time of calipers closing between the mains cut-off and application of 66% of nominal torque.

Caliper	3CA2	0SA	00SA
Tr 66 (ms)	265	150	150

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED
Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

Electrical Power Units

ELECTRICAL POWER UNIT - DC64-50 CP

Revision number: T04530-01-F **Revision date: 25.02.2019**

Compact power supply operating on direct mains.
For SIME disc brakes with 50V coil.
type: 660/650-5K/5D-645-45K-4WD-4CA2
Polycarbonate case

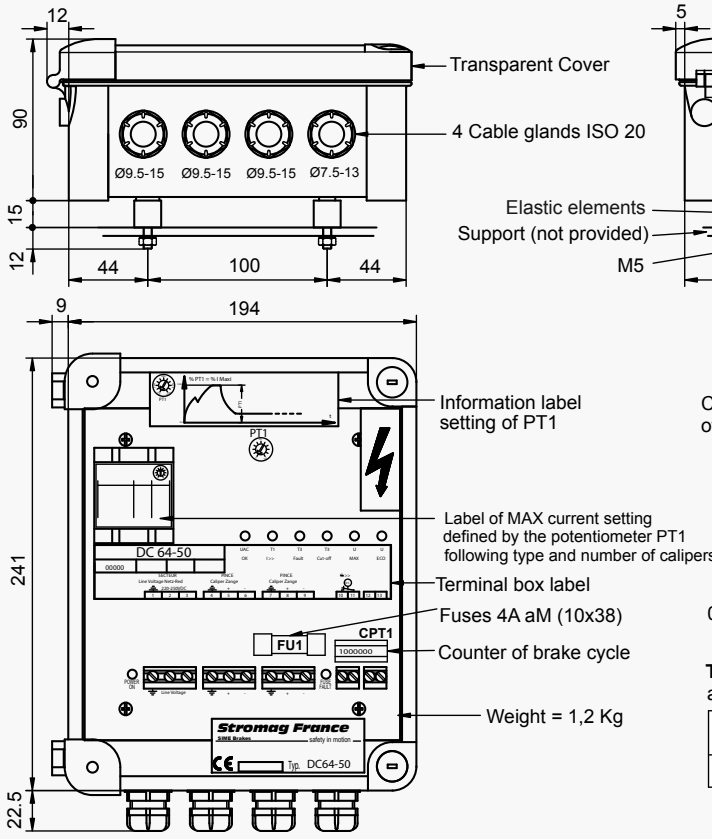
Operating conditions:
- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

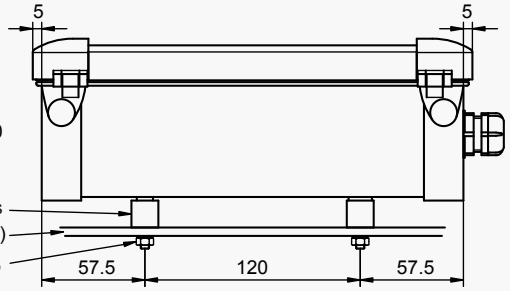
Electrical data:
Mains DC: 100 to 275 V DC ± 10%
Possible operation in 115 V AC ± 20%

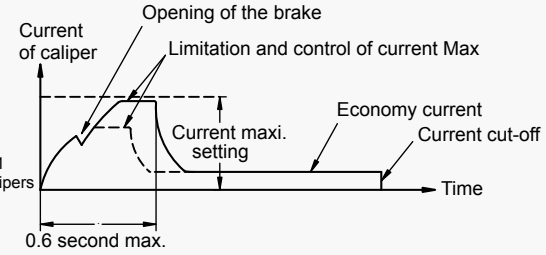
EC marking of conformity:
2006/95/EC directive BT (standard EN60204-1)
2004/108/EC directive CEM (EN61000-6-2 EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK09

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED
Control and power electronic of power supply is not insulated and is under mains voltage.







Time of calipers closing (time between mains cut-off and application of 66% of nominal torque).

Caliper	660-5KR-5DR	650-650E 5K-5D-5KE-5DE	645-45K	4WD	4CA2
Tr 66 (ms)	100	100	120	300	200

Caliper			660-650-650E		5K-5D-5KR-5DR 5KE-5DE		645		45K		4WD		4CA2
Maximum number of calipers			2		2		2		2		2		1
Resistance at 20°C per caliper		(Ω)	6.68		6.68		4.52		4.52		4.52		3.08
Maximum number of actuations per hour and ambient temperature θ	θ ≤40°C		150		1000		150		1000		60		1000
	40°C<θ ≤60°C		150		600		150		600		60		600
Mains current absorbed per caliper	Max	(A)	3.5		3.5		5		5		5		9
	Economy	(A)	0.4		0.4		0.5		0.5		0.5		0.75
Maximum return resistance of the cable connecting the caliper to the power supply		(Ω)	2		2		1		1		1		1 ✱
Max. length of the connecting cable (Power supply - caliper) for 1 caliper per cable, depending on cable section	2.5 mm²	(m)	100		100		50		50		50		50 ✱
	4 mm²	(m)	160		160		80		80		80		80 ✱
	6 mm²	(m)	240		240		120		120		120		120 ✱
Protection to be provided in head of control contactor on mains input	Number of caliper		1	2	1	2	1	2	1	2	1	2	1
	Fuse aM	(A)	1	2	1	2	2	4	2	4	2	4	4
	Circuit-breaker curve C	(A)	1	2	1	2	2	4	2	4	2	4	4

✱ If the ambient temperature of the caliper 4CA2 is higher than 60°C.
the maximum return resistance and the maximum length of the connecting cable given in the above table must be divided by 2.

ELECTRICAL POWER UNIT - DC32-50 CP

Revision number: T10007-01-G **Revision date: 09.04.2018**

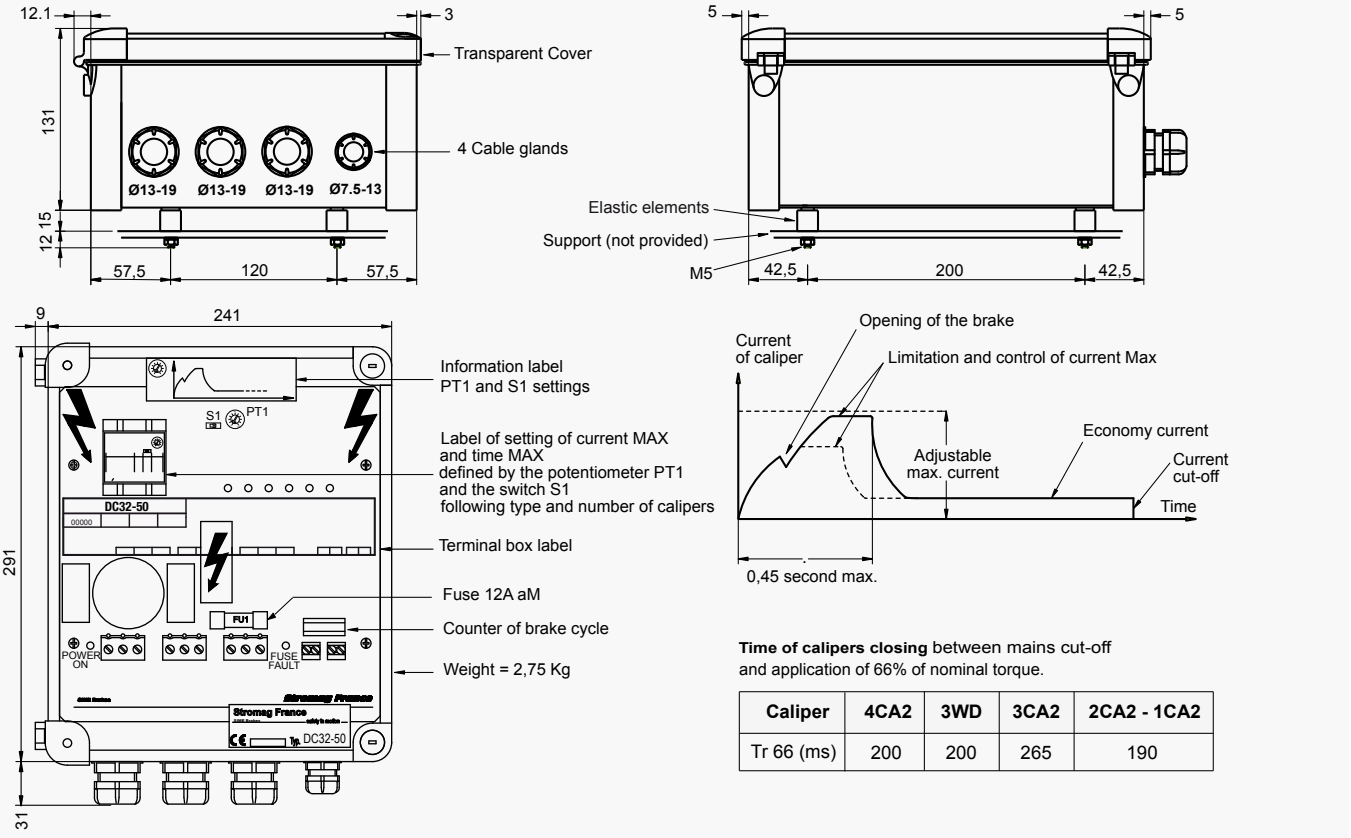
Compact power supply operating on direct mains.
For SIME disc brakes with 50V coil.
type: 4CA2 - 3WD - 3CA2 - 2CA2
Polycarbonate case

Operating conditions:
- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

Electrical data:
Mains DC: 110 to 275V DC ± 10%
Possible operation in 115 V AC ± 20%

EC marking of conformity:
- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK10



Time of calipers closing between mains cut-off and application of 66% of nominal torque.

Caliper	4CA2	3WD	3CA2	2CA2 - 1CA2
Tr 66 (ms)	200	200	265	190

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED
Control and power electronic of power supply is not insulated and is under mains voltage. The power supply must be installed by qualified personnel, used to handle this equipment type and aware of risks inherent in their utilization.

Caliper			4CA2	3WD	3CA2	2CA2 1CA2	2CA2 + 20% 1CA2 + 20%
Maximum number of calipers			2	1	1	1	
Resistance at 20°C per caliper		(Ω)	3.08	1.63	1.01	0.75	
Maximum number of actuations per hour and ambient temperature θ	θ ≤40°C		1000	60	1000	1000	600
	40°C<θ ≤60°C		600	60	600	600	300
Mains current absorbed per caliper	Max	(A)	9.9	18	24.1	36.9	
	Economy	(A)	1.5	1.6	1.8	2.3	
Maximum connecting cable return resistance between caliper and supply unit		(Ω)	1	0.75	1	0.5	
Max. length of the connecting cable (Power supply/ caliper) for 1 caliper per cable. depending on cable section	2.5mm²	(m)	50	35	50	25	
	4mm²	(m)	80	60	80	40	
	6mm²	(m)	120	90	120	60	
	10mm²	(m)	205	155	205	100	
Protection to be provided in head of control contactor on mains input	Fuse aM	(A)	6	6	6	10	
	Circuit-breaker curve C	(A)	8	8	10	16	

Electrical Power Units

ELECTRICAL POWER UNIT - DS100-50 CP

Revision number: T10037-01-B **Revision date: 15.11.2016**

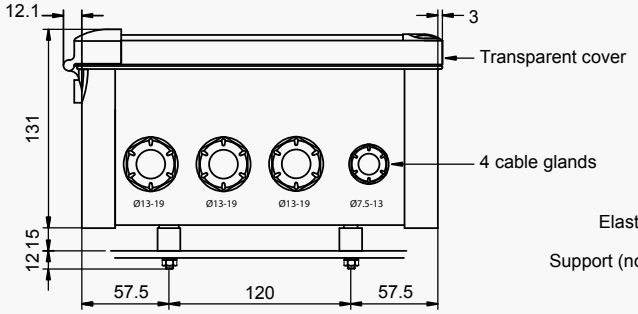
Compact power supply operating on direct mains.
For SIME disc brakes with 50 V coil type: OSA - OOSA
Polycarbonate case

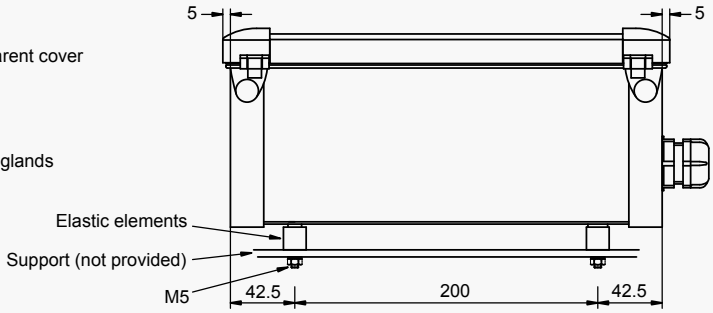
Operating Conditions:
- Casing protection standard IP66 IK08
- Ambient temperature: -20°C to +60°C

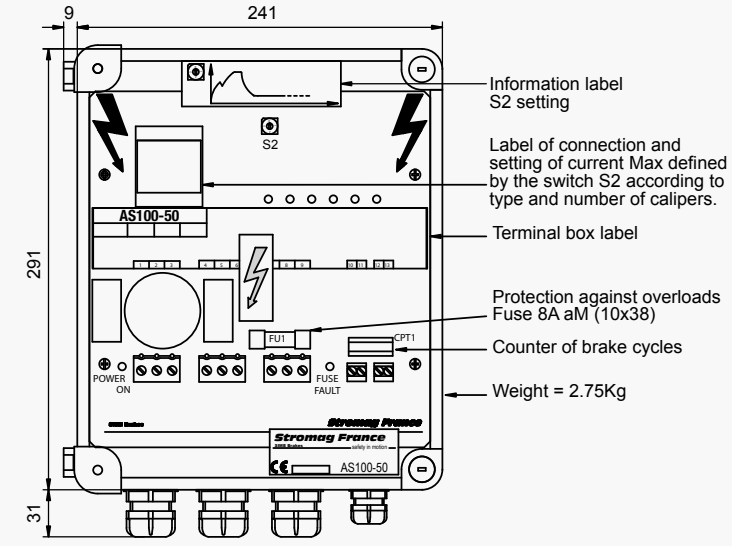
Electrical Data:
Mains DC: 110 to 275V DC ± 10%
Possible operation in 115 V AC ± 20%

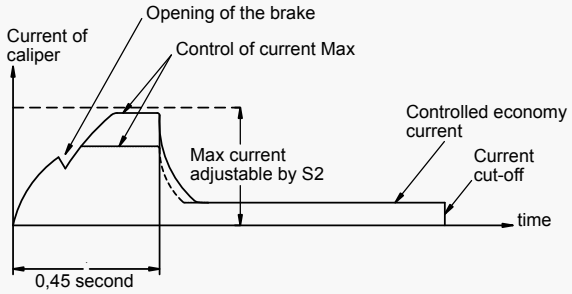
EC marking of conformity:
- 2006/95/CE directive Low Voltage (standard EN60204-1)
- 2004/108/CE directive EMC (standards EN61000-6-2 and EN61000-6-4)

Options:
- Closure delay of the caliper
- Disengageable closure delay of the caliper (cannot be combined with anti-condensation)
- Anti-condensation kit
- Steel case IP66 IK10









Time of calipers closing between the mains cut-off and application of 66% of nominal torque.

Caliper	0SA	00SA
Tr 66 (ms)	160	160

ELECTRICAL DANGER: THIS PRODUCT IS NOT INSULATED
Control and power electronic of power supply is not insulated and is under mains voltage.
The power supply must be installed by qualified personnel. used to handle this equipment type and aware of risks inherent in their utilization.

Caliper			0SA	0SA	00SA
Maximum number of calipers			1	2	1
Resistance at 20°C per electromagnet		Ω	1.01	1.01	1.01
Maximum number of actuations per hour and ambient temperature θ	θ ≤60°C		100	100	100
Mains current absorbed	Max	A	33	38	38
	Economy	A	2.6	3.3	3.3
Maximum connecting cable return resistance between caliper and supply unit		Ω	3.5	1	1
Maximum connecting cable length (caliper-input) according to the cable section	2.5 mm²	m	170	50	50
	4 mm²	m	275	80	80
	6 mm²	m	415	120	120
	10 mm²	m	715	205	205
Protection to be provided in head of control contactor on mains input	Fuse aM	A	8	8	8
	Circuit-breaker curve C	A	16	16	16

ELECTRICAL POWER UNIT - 4200

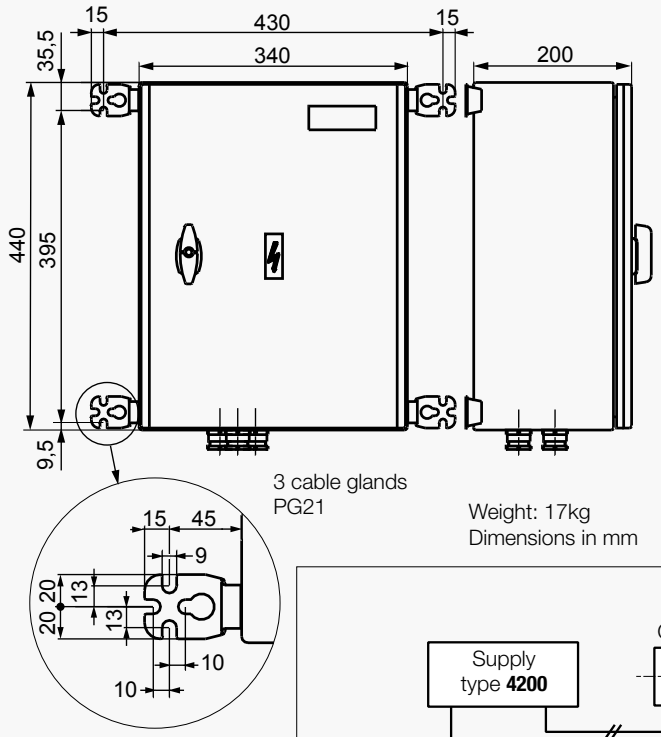
Revision number: T04800-01-C **Revision date: 21.10.2015**

2 presentations are available:
- C for casing protected version
- P for plate mounted version

Note:
if 2 calipers are driven by the same power supply (or the 2 coils of the caliper OOSA) they must be connected in series (refer to the installation and maintenance leaflet)

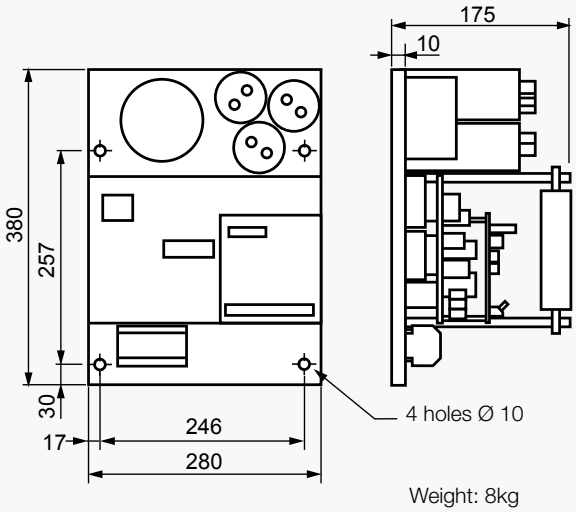
Operating conditions:
- Line voltage:
  - direct: 115V to 600VDC ± 10%
  - single or three phases: 115V to 500VAC ± 10% 50/60Hz
- Ambiant temperature: -20°C to +55°C

Type C4200 casing protected version (casing IP 66 standard EN60529)

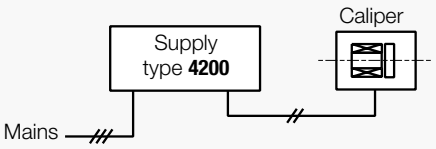


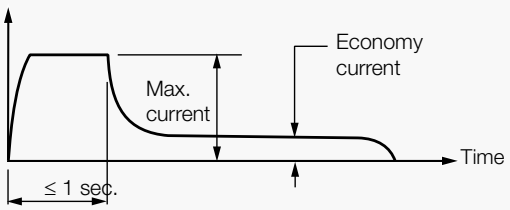
Weight: 17kg
Dimensions in mm

Type P4200 plate mounted version (for cabinet assembly)



Weight: 8kg
Dimensions in mm





CALIPER	Type		4CA		3CA		OSA		OOSA	2SA	
	Number		1	2	1	2	1	2	1	1	2
Maximum number of actuations per hour at 40°C			700		1000		100			100	
Power consumption of the power supply	Maximum	W	1695	3215	1355	2480	2850	5380	5380	8205	15 815
	Economy	W	105	140	130	175	305	480	480	205	300
Max. connecting cable return resistance caliper to supply unit (for 1 coil)		Ω	1		1		1			1	1
Delayed fuse rating to be provided between power supply and mains:											
direct:	115 VDC	A	25		25		25				
	230 VDC	A	25		25		25			35	
	400 to 600 VDC	A	25		25		25			35	35
single phase:	115 VAC	A	25		25		25				
	230 VAC	A	25		25		25			35	
	400 VAC	A	25		25		25			35	35
	500 VAC	A	25		25		25			25	25
3 phases:	230 VAC	A	25		25		25			25	
	400 VAC	A	16		16		16			25	25
	500 VAC	A	16		16		16			16	16

Electrical Power Units

ELECTRICAL POWER UNIT - 4205

Revision number: T04810-01-B **Revision date: 21.10.2015**

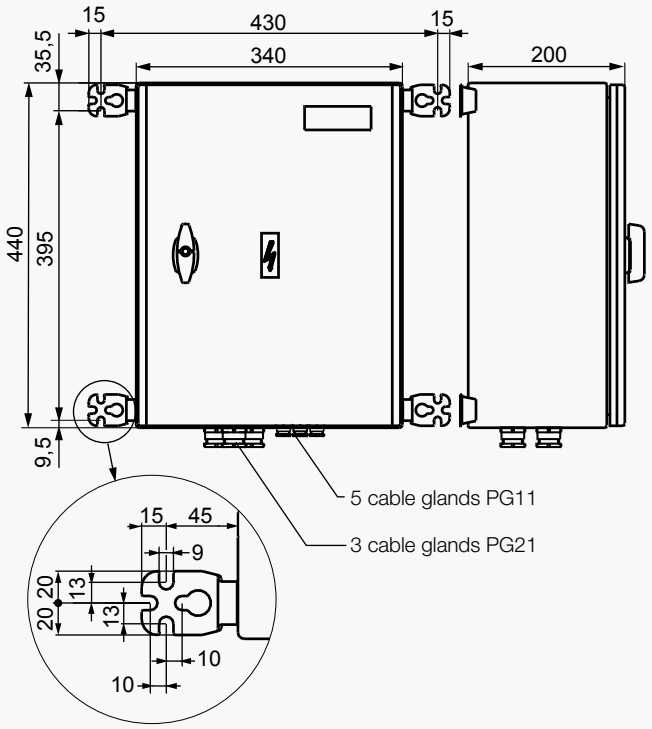
Designed for normal control or progressive release of electrical calipers to perform lowering maneuvers.

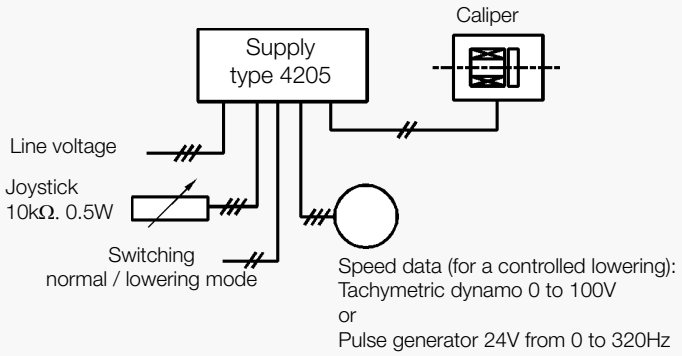
2 presentations are available:
- C for casing protected version
- P for plate mounted version

Operating conditions:
- Line voltage:
  - direct: 115V to 600VDC ± 10%
  - single or three phases: 115V to 500VAC ± 10% 50/60Hz
- Ambiant temperature: -20°C to +55°C

Type C4205 casing protected version (casing IP 66 EN60529)

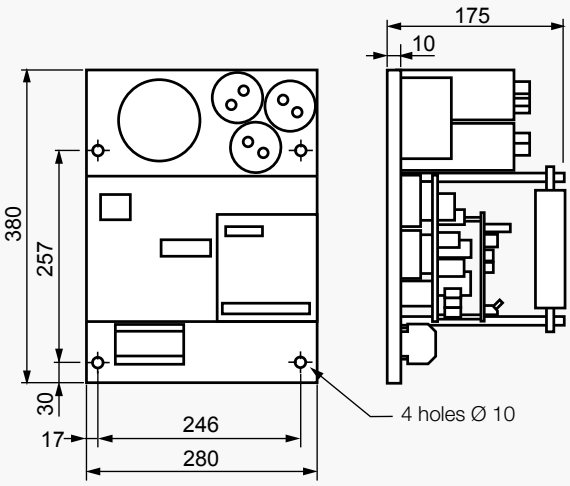
Weight: 17kg

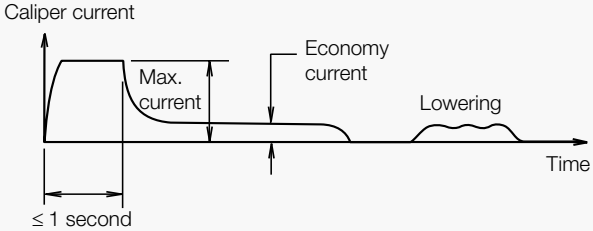




Type P4205 plate mounted version (for cabinet assembly)

Weight: 8kg





ELECTRICAL POWER UNIT - 4205

Revision number: T04810-01-B **Revision date: 21.10.2015**

Notes:

- Lowering a load is performed manually, with or without vertical speed control, by progressively releasing the calipers (between 100% and 50% of the nominal torque)
- 2 calipers driven by the same power supply (or the 2 coils of the caliper OOSA) must be connected in series (refer to the installation and maintenance leaflet)
- For lowering with calipers 4CA2, contact us.

Note: by insulated kinematics (e.g.: a drum), the lowering command is performed only for one of the **4205** electrical supply units. This unit is called the "master".
One "master" unit can drive up to 5 "slave" units.

CALIPER	Type		4CA2		3CA2		OSA		OOSA	2SA	
	Number		1	2	1	2	1	2	1	1	2
Maximum number of actuations per hour at 40°C			700		1000		100			100	
Power consumption of the power supply	Maximum	W	1695	3215	1355	2480	2850	5380	5380	8205	15 815
	Economy	W	105	140	130	175	305	480	480	205	300
Max. connecting cable return resistance caliper to supply unit (for 1 coil)		Ω	1		1		1			1	1
Delayed fuse rating to be provided between power supply and mains:											
direct:	115 VDC	A	25		25		25				
	230 VDC	A	25		25		25			35	
	400 to 600 VDC	A	25		25		25			35	35
single phase:	115 VAC	A	25		25		25				
	230 VAC	A	25		25		25			35	
	400 VAC	A	25		25		25			35	35
	500 VAC	A	25		25		25			25	25
3 phases:	230 VAC	A	25		25		25			25	
	400 VAC	A	16		16		16			25	25
	500 VAC	A	16		16		16			16	16

Forbidden association

NOTES

ELECTRICAL POWER UNIT - AB8

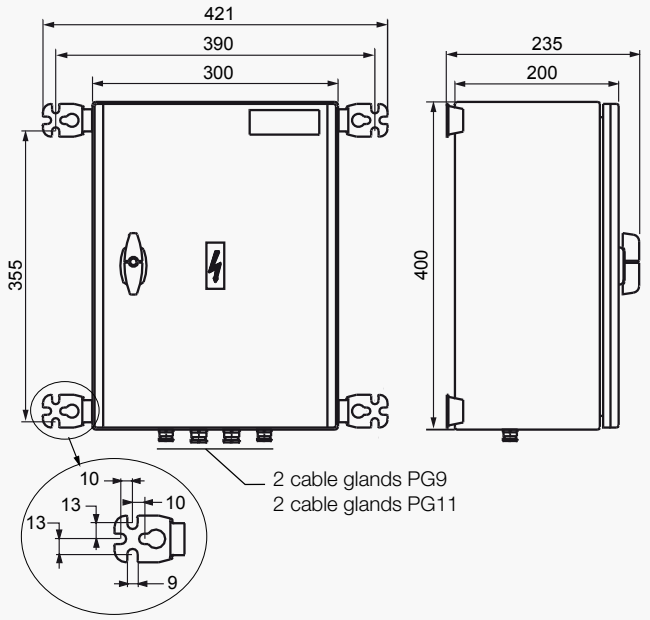
Revision number: T04400-01-B **Revision date: 21/07/2016**

Designed for control of the progressive braking effort by means of a foot pedal.
2 presentations are available:
- casing protected version C
- plate mounted version P

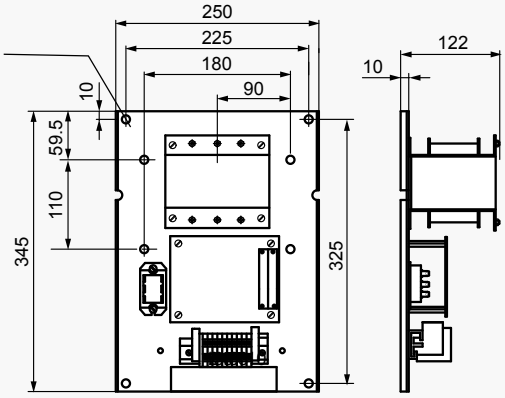
Matching CE markings:
- 73/23/CEE BT directive
- 89/336/CEE CEM directive
(specifications EN50081-2 EN50082-2 EN6 0204-1)

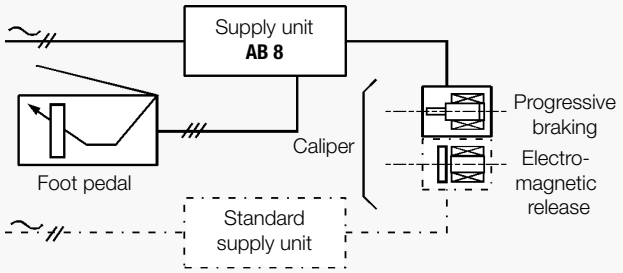
Working conditions:
- Voltage(single phase)
  230/400V
  or 400/415V
  or 400/440V ± 10% 50/60Hz
  or 400/460V
  or 400/500V
- Working ambient temperature: -20°C to +60°C

Type C AB8 protected version (casing IP 669 standard DIN 40050) Weight: 16 kg



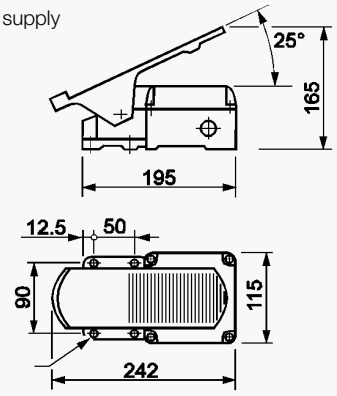
Type P AB8 plate mounted version (for cabinet assembly) Weight: 8 kg





Control pedal:
it can drive 1 or 2 supply units AB8

Weight: 1.9kg



Caliper		650 E - 5 KE - 5 DE	
Number of calipers		**1**	**2**
Power consumption in Watts for an output voltage of 20V DC		115	230
Voltage		3 to 24V DC	
Maximum connecting cable return resistance (caliper to supply unit)	Ω	0.5	0.5
Primary fuse DIN "NH" type. "aM" class to be provided	230 V	1A	2A
	400/415 V	1A	2A
	440/460/500 V	1A	2A

HYDRAULIC POWER PACKS

Hydraulic Power Packs

CALIPERS Associated quantity: consult us for required opening times	SHPU1			SHPU2				SHPU3		SHPU3 MOPS or SB	
	Tank 5L (useful 4.5L)			Tank 8L (6L)		Tank 11L (7.5L)		Tank 35L (30L)		Tank 8L (6L)	
	0.37 kW	0.75 kW	2.2 kW	0.75 kW	2.2 kW	0.75 kW	2.2kW	0.75 kW	2.2kW	0.75 kW	2.2 kW
	24 kg to 40 kg ∗			36 kg to 49 kg ∗		39 kg to 52 kg ∗		85 kg to 110 kg ∗		46 kg to 60 kg ∗	
SH1	1 › 7	8 › 12		1 › 12		1 › 12		1 › 12	13 › 50	1 › 12	
SHD1	1 › 6	7 › 14		1 › 14		1 › 14		1 › 12	13 › 60	1 › 12	13 › 16
SH5	1	2 › 4	5		1 › 5		6 › 9		1 › 30		1 › 5
SHD5A	1	2 › 4	5 › 7		1 › 6		7 › 10		1 › 39		1 › 6
SH9A		1 › 2	3		1 › 3		4 › 5		1 › 17		1 › 3
SHD9		1 › 2	3		1 › 3		4 › 5		1 › 19		1 › 3
TH9		1 › 2			1 › 2		3 › 4		1 › 16		
SHM10		1		1		1 › 2		1 › 9			
SH15-SH18B			1 › 2				1 › 3		1 › 10		1 › 2
SH25			1				1 › 2		1 › 6		1
SH32			1				1		1 › 5		1
OPTIONS											
CPS •	x	x	x	x	x	x	x	x	x	x	x
Mano	x	x	x	std	std	std	std	std	std	std	std
MS	x	x	x	x	x	x	x	x	x	x	x
OP1	x	x	x	x	x	x	x	x	x		
OP1-OP2 or OP3				x	x	x	x	x	x		
Y5				x	x	x	x	x	x		
Y1-3				x	x	x	x	x	x		
OP5E				x	x	x	x	x	x	x	x
OP6	x	x	x	x	x	x	x	x	x	x	x
OP7-8				x	x	x	x	x	x	x	x
OP10				x	x	x	x	x	x	x	x
SOFT BRAKING ⁂								x	x	std	std
MOPS ⁂								x	x	std	std
ACC+ ⁂								x	x		
Oil heater						x	x	x	x		

- With **K-SI** electrical unit, the pressure switch (CP or CPS) is replaced by a pressure sensor, consult us.

⁂ This option requires adjustments inherent to the installation. It is imperative to consult us.

∗ with oil and without electrical unit

Hydraulic Power Packs

HYDRAULIC POWER PACKS - SHPU1

Revision number: T010179-01-D **Revision date: 02.03.2022**

Characteristics:

- Motor 0,37 kW or 0,75 kW or 2.2 kW (depends on type and number of the associated calipers)
- Tank: capacity = 5L (useful 4,5L)
- Hand pump PAM
- Electronic pressure switch
- Solenoid valve 24VDC
- Damping accumulator
- Vertical installation
- Weight with oil: 24 to 40 kg without K unit

Operating conditions:

- Working pressure:
  250 bars max. (except **SHM10**: 90bars)
  service: 180/200bars (**SHM10**: 55/10 bars)
- Ambient temperature: -20°C to +70°C ■ options SID and GF (-40°C), consult us.
- Relative humidity:≤ 100%
- Protection level:
  C4M-L anti-corrosive (acc. to ISO12944)
  Paint C5M-L in option
- Tightness level: IP55

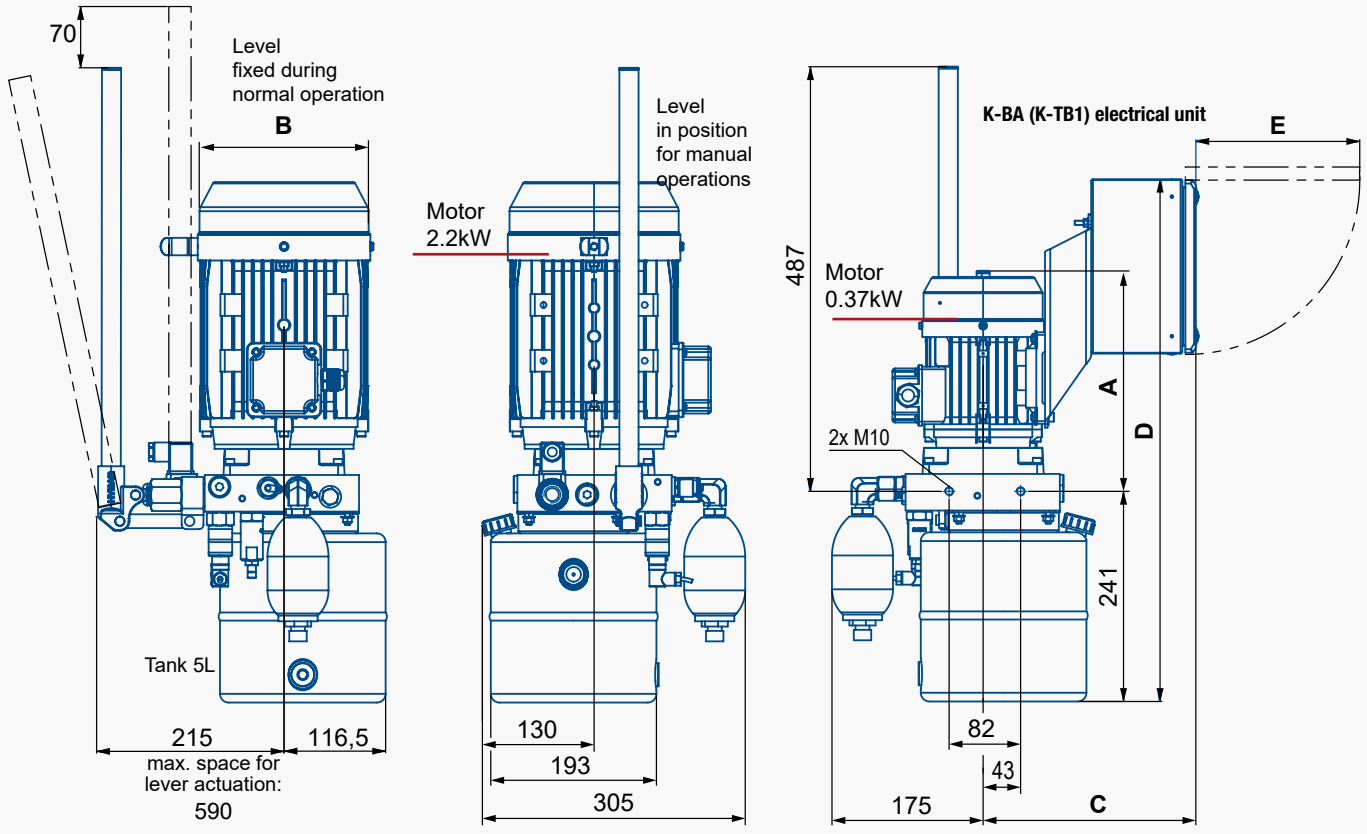
■ *Indicate operating T° for appropriate oil type*

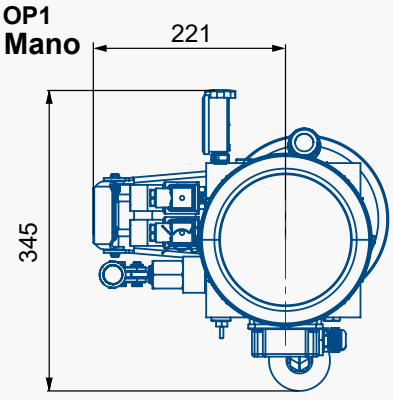
Options:

CPS	Mechanical pressure switch
EVS	Solenoid valve(s) 230VAC
MS	Motor special voltage
Mano	Manometer
OP1-DM	Enhanced security on return circuit
OP6	For iron and steel industry

Electrical unit: **K-TB or K-BA or K-SI** depending on options

For opening and closing times, consult the complete technical leaflet at: download.stromagfrance.com

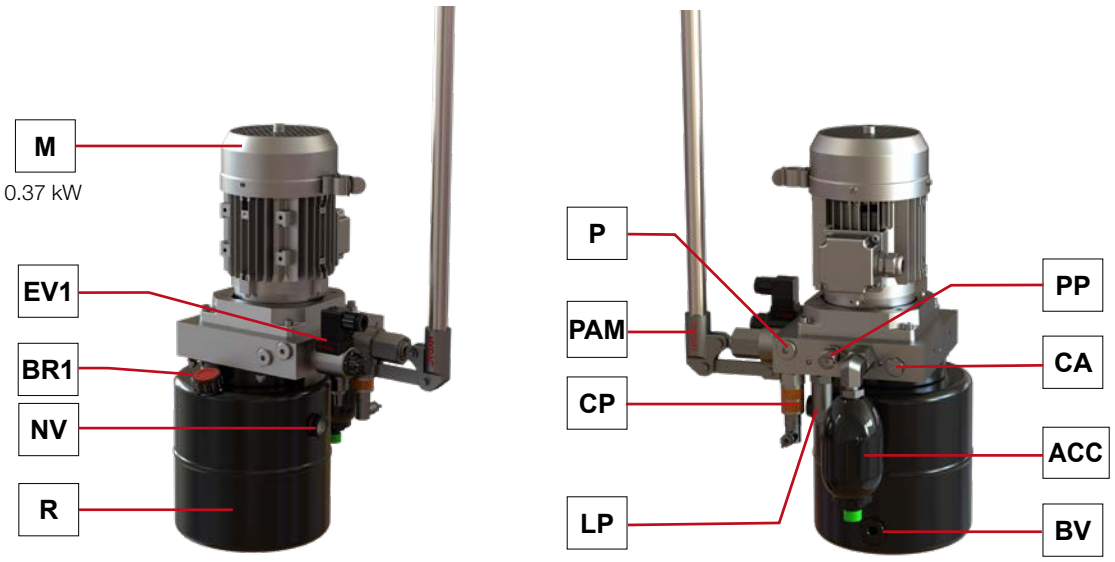


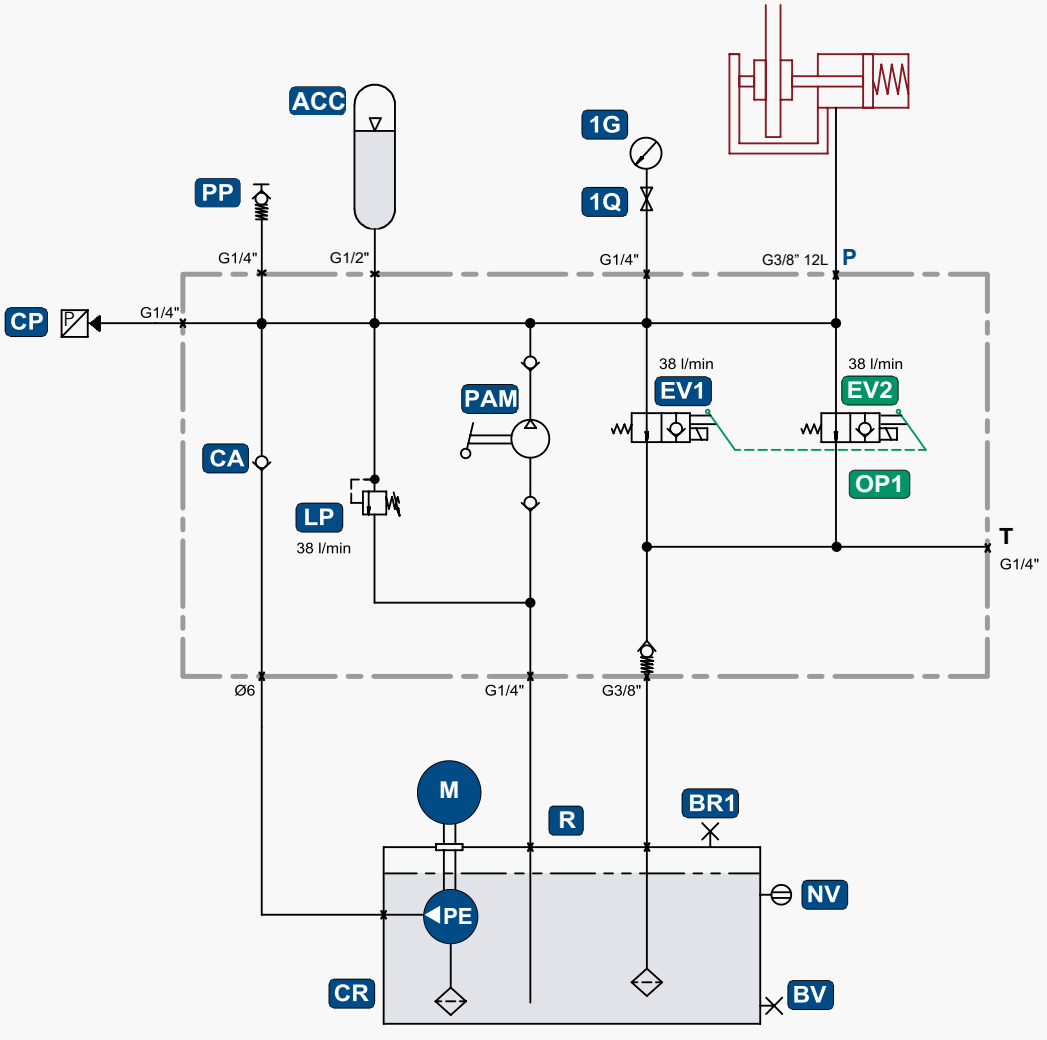


SHPU1	Electrical unit	with Motor		
		0.37kW	0.75kW	2.2kW
A (mm)	-	280	332	355
ØB (mm)	-	140	155	200
C (mm)	K-BA	245	255	275
D (mm)		600	605	615
E (mm)		200		
C (mm)	K-SI	235	245	265
D (mm)		700	700	720
E (mm)		300		

HYDRAULIC POWER PACKS - SHPU1

Revision number: T010179-01-D **Revision date: 02.03.2022**





Hydraulic Power Packs

HYDRAULIC POWER PACKS - SHPU2

Revision number: T010179-01-D **Revision date: 02.03.2022**

Characteristics:

- Motor 0,75 kW or 2.2 kW (depends on type and number of the associated calipers)
- Tank 8L (useful 6L) or 11L (useful 7,5L)
- Hand pump PAM-DM
- Electronic pressure switch
- Solenoid valve 24VDC
- Damping accumulator
- Clogging and oil level visual indicators
- Vertical installation
- Weight with oil and without K unit: tank 8L: 36 to 49 kg / tank 11L: 39 to 52 kg

Operating conditions:

- Working pressure: 250 bars max. (except **SHM10**: 90bars) service: 180/200bars (**SHM10**: 55/10 bars)
- Ambient temperature: -20°C to +70°C ■ options SID and GF (-40°C), consult us.
- Relative humidity:≤ 100%
- Protection level: C4M-L anti-corrosive (acc. to ISO12944) Paint C5M-L in option
- Tightness level: IP55

■ *Indicate operating T° for appropriate oil type*

Options:

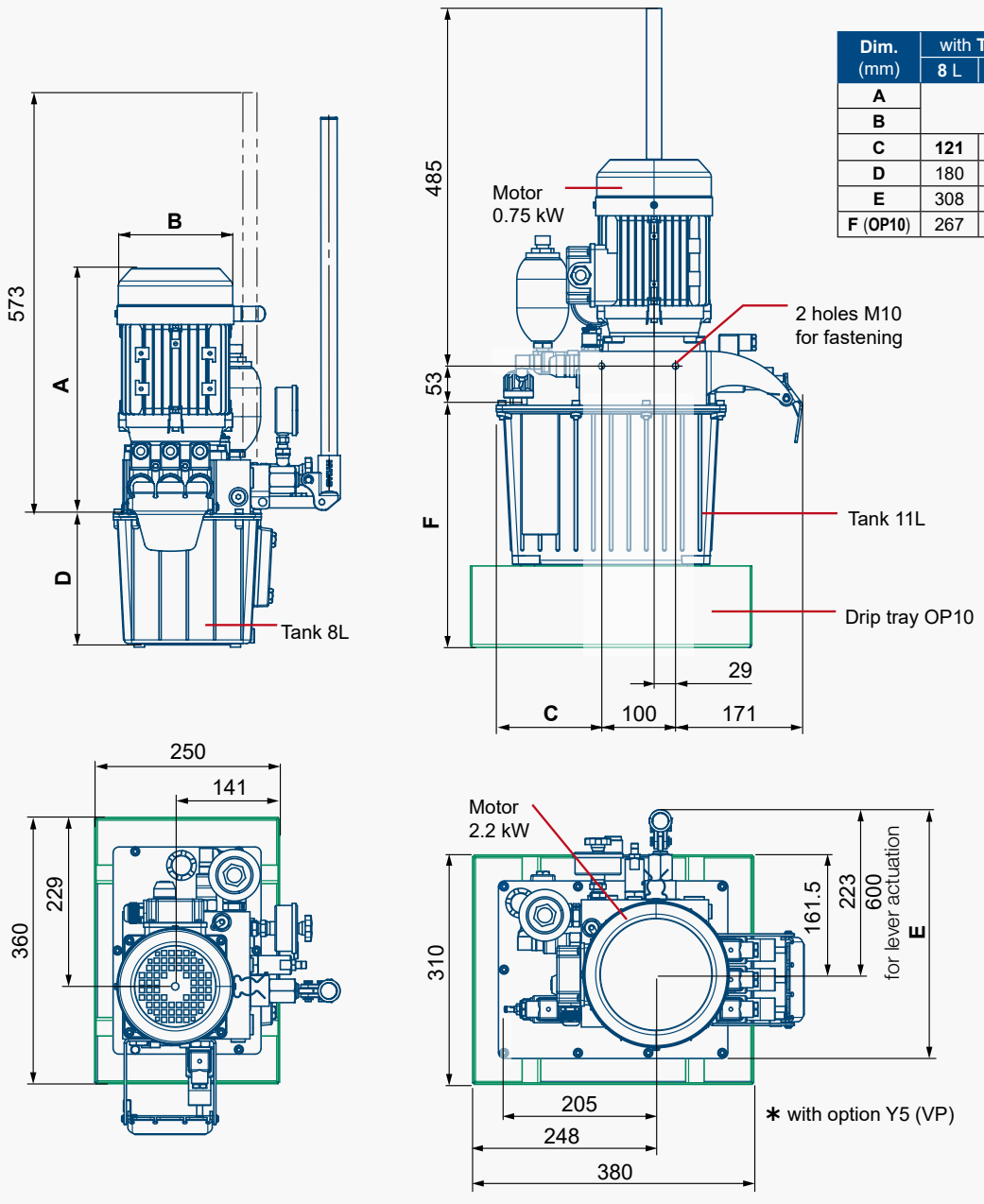
CPS - EVS - MS - OP6

OP1	Enhanced security on return circuit
OP1-OP2	Manual lowering with dead man safety
OP1-OP3	Manual lowering with overspeed
Y5	Regulated braking
Y1-3	Stepped braking
OP5E	Electrical clogging indicator
OP7-8	Oil temperature & level electrical indicator
OP10	Drip tray / Oil heater (11L tank) (APS)

Electrical unit: **K-TB or K-BA or K-PR or K-SI** depending on options

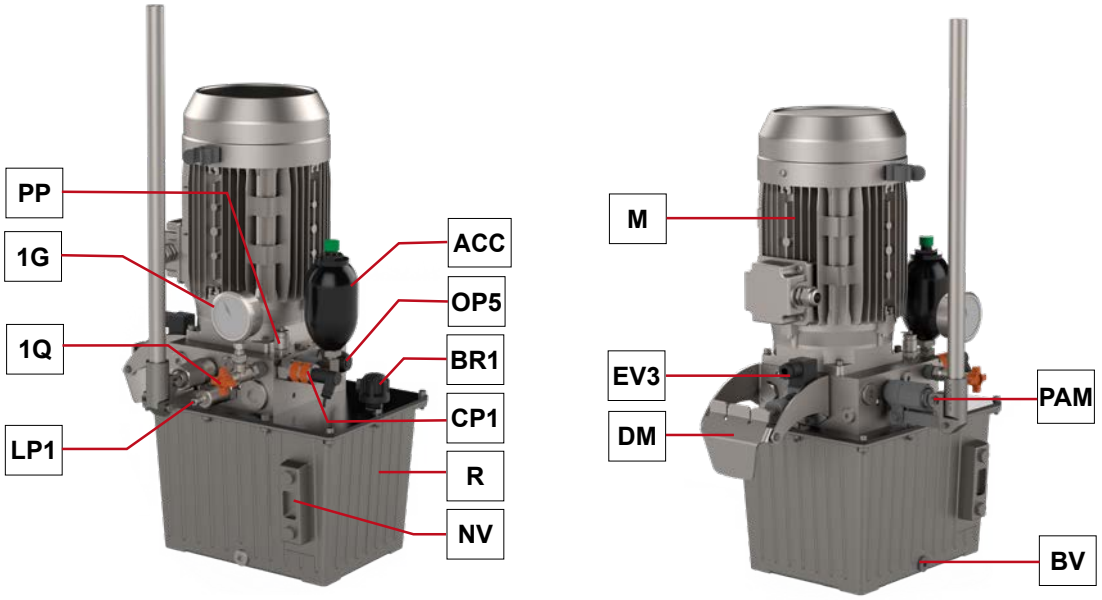
For opening and closing times, dimensions with electrical units, consult the complete technical leaflet at: download.stromagfrance.com

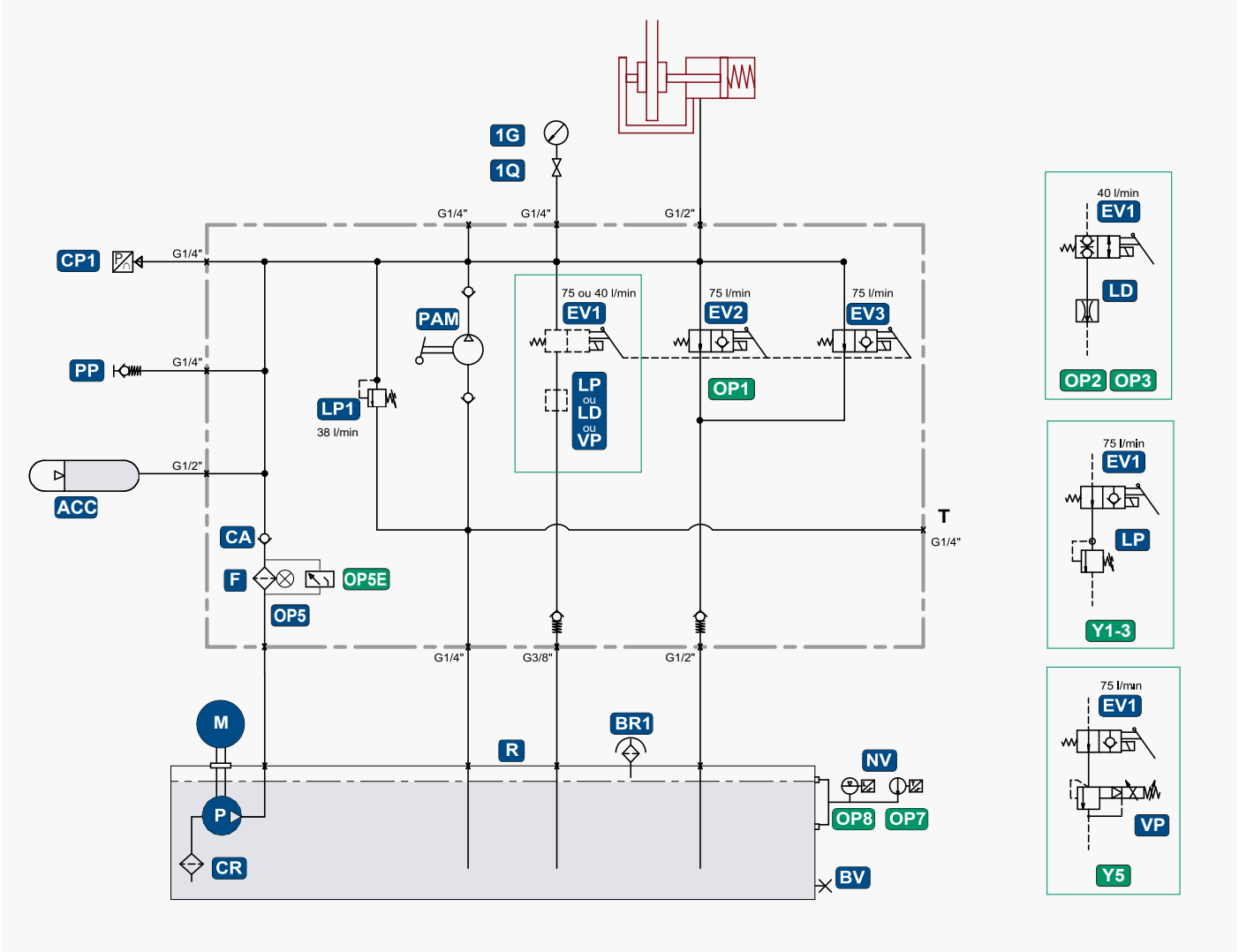
Dim. (mm)	with Tank 8 L	with Tank 11 L	with Motor 0.75 kW	with Motor 2.2 kW
A			332	409
B			155	200
C	121	141		
D	180	220		
E	308	332		
F (OP10)	267	325		



HYDRAULIC POWER PACKS - SHPU2

Revision number: T010179-01-D **Revision date: 02.03.2022**





HYDRAULIC POWER PACKS - SHPU3

Revision number: T010179-01-D **Revision date: 02.03.2022**

Characteristics:

- Motor 0,75 kW or 2.2 kW (depends on the associated calipers type and number)
- Tank 35L (useful 30L) or 8L (useful 6L)
- Hand pump PAM-DM
- Electronic pressure switch
- Solenoid valve 24VDC
- Damping accumulator
- Clogging and oil level visual indicators
- Vertical installation
- Weight with oil and without K unit: tank 35L: 85 to 110 kg / tank 8L: 46 to 60 kg

Operating conditions:

- Working pressure: 250 bars max. (except **SHM10**: 90bars) service: 180/200bars (**SHM10**: 55/10 bars)
- Ambient temperature: -20°C to +70°C ■ options SID and GF (-40°C), consult us.
- Relative humidity:≤ 100%
- Protection level: C4M-L anti-corrosive (acc. to ISO12944) Paint C5M-L in option
- Tightness level: IP55

■ *Indicate operating T° for appropriate oil type*

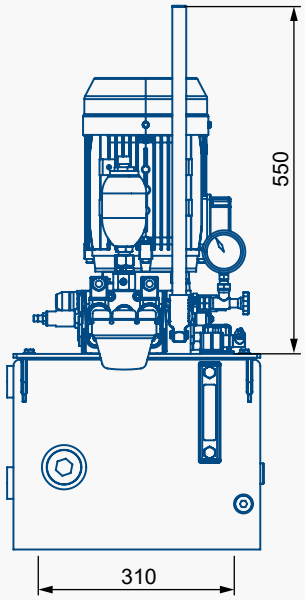
Options:

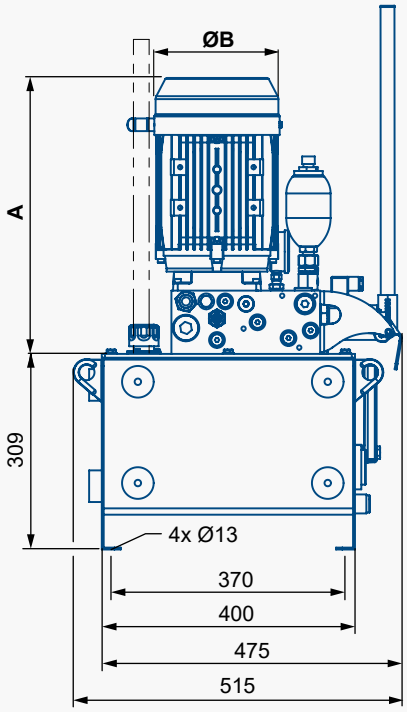
CPS - EVS - MS - OP1 - OP5E - OP6 - OP7-8 - OP10

OP1-OP2	Lowering with dead man safety
OP1-OP3	Lowering with overspeed detection
Y5	Regulated braking
Y1-3/OP1	Stepped braking
SOFT BRAKING	need a specific calculation for hydraulic design, consult us
MOPS	
ACC+	

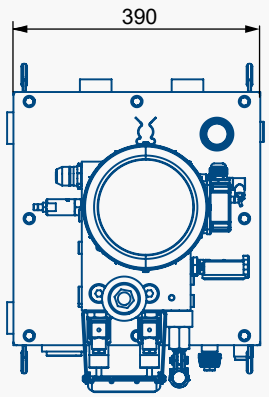
Electrical unit: **K-TB or K-BA or K-PR or K-SI** depending on options

For opening and closing times, dimensions with all the other options, consult the complete technical leaflet at: download.stromagfrance.com

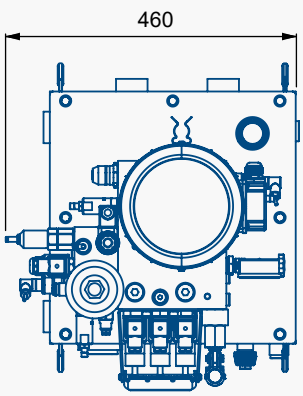




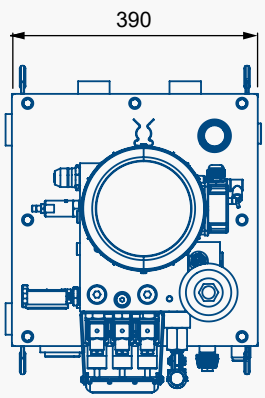
Dimensions (mm)	with Motor	
	0.75 kW	**2.2** kW
A	359	436
B	155	200



MOPS

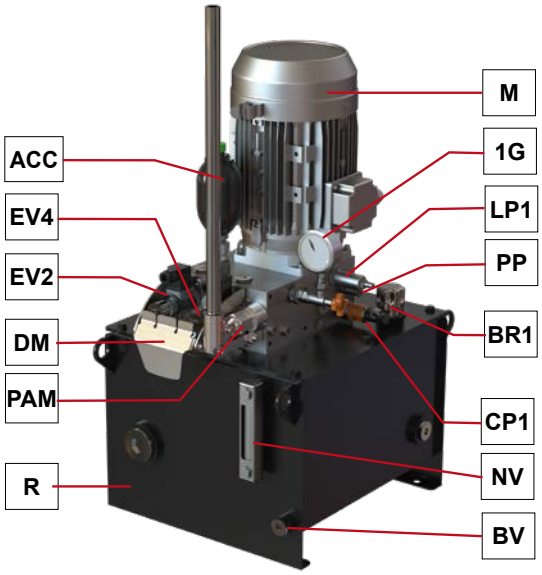


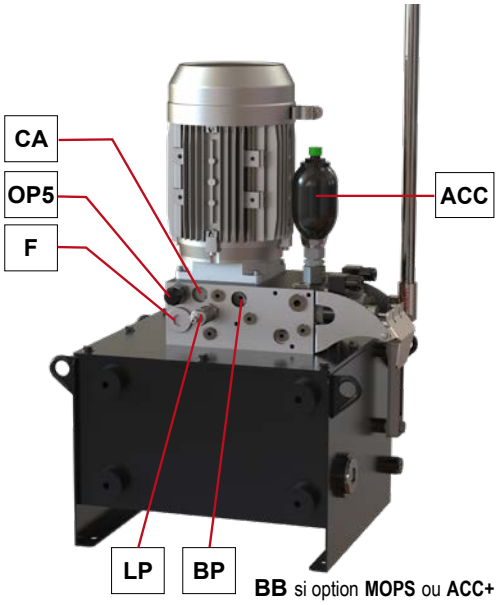
SOFT BRAKING



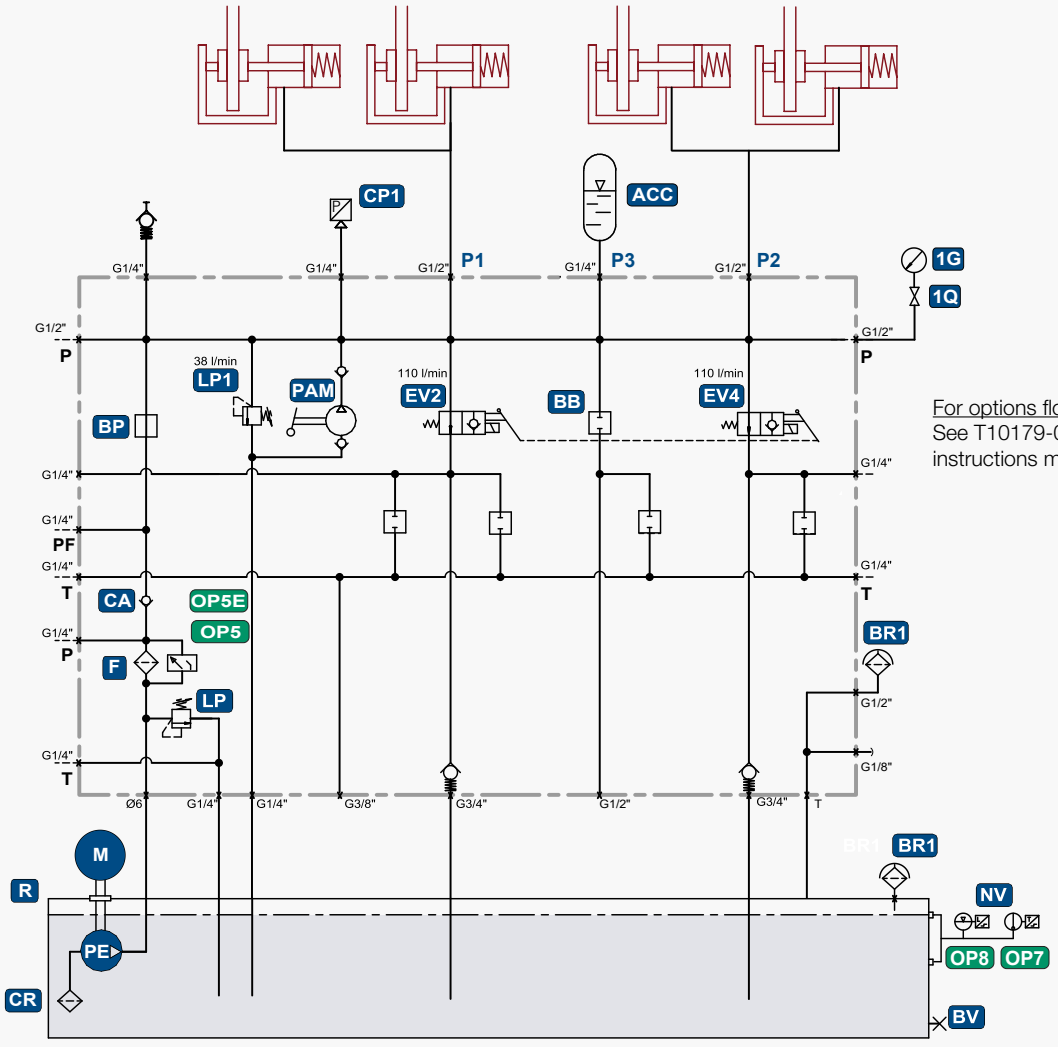
HYDRAULIC POWER PACKS - SHPU3

Revision number: T010179-01-D **Revision date: 02.03.2022**





BB si option **MOPS** ou **ACC+**



For options flow diagrams:
See T10179-01 and M10183-01 instructions manuals.

HYDRAULIC POWER PACKS - SHPU1, SHPU2 and SHPU3

Revision number: T010179-01-D **Revision date: 02.03.2022**

ELECTRICAL UNITS FOR HYDRAULIC POWER PACKS SHPU1, SHPU2 and SHPU3

K-TB	K- T Box (Terminal Box) / K-TB1 or K-TB2: 10 or 20 inputs/outputs
K-BA	K-Basic
K-PR	K-Premium
K-SI	K-Siman
K-PR-Y5 ✳	K-Premium with amplifier for Y5
K-SI-Y5 ✳	K-Siman with amplifier for Y5

✳ Consult us

Siman is a **S**afety **I**ntelligent **MAN**ager system for hydraulic monitoring and control of the **SHPU** HPP.
It is part of the Stromag **SioT** system.
It is integrated in the **K-SI** electrical unit and can be also integrated directly in the customer control enclosure.

SHPU1	
STANDARD	
OP1	

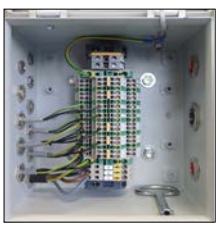
SHPU2	
STANDARD	for control, monitoring and safety functions
OP1	
OP5E	
OP7-8	
OP1-OP2	
OP1-OP3	
Y1-3	
Z	
Y1-3 Z	
Y5 ✳	

✳ Consult us

SHPU3 - 35L	
STANDARD	for control, monitoring and safety functions
OP1	
OP5E	
OP7-8	
OP1-OP2	
OP1-OP3	
Y1-3	
Z	
Y1-3 Z	
Y5 ✳	
ACC+	
Soft Braking	
MOPS	

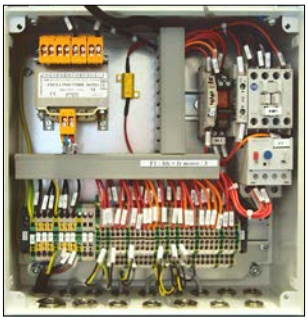
SHPU3 - 8L	
Soft Braking	Consult us
MOPS	
OP5E	
OP7-8	

K-BA Basic
K-PR Premium
K-SI Siman
K-TB TBox



K-TB1
Terminal Box

K-BA
Basic Electrical Unit



K-PR
Premium Electrical Unit

K-SI
Electrical Unit with Siman

HYDRAULIC POWER PACKS - C3BSH·CSH·CE8L·CE12L·SB210

Hydraulic Power Packs available only for replacement, consult us. download.stromagfrance.com

<table>
<tr><th>HYDRAULIC POWER PACKS</th><th>TANK</th><th>PRESSURE MAX.</th><th>CALIPERS ASSOCIATED</th><th>MAIN CHARACTERISTICS</th></tr>
<tr><td>C3BSH
  </td><td>4 L</td><td>180 bars</td><td>SHD2 - SHD5
SH5 - SH9
TH9</td><td>• Vertical installation - Weight without oil = 27 kg
• Options:
<table><tr><td>MS</td><td>Special motor</td></tr><tr><td>OP1</td><td>Enhanced security return circuit by 2 solenoid valves</td></tr><tr><td>R</td><td>Braking torque adjustment</td></tr><tr><td>AF</td><td>Manual lowering with a dead man safety design</td></tr><tr><td>OP6</td><td>Tight HPP for iron and steel industry</td></tr><tr><td>Y1-3</td><td>Caliper closing with stepped braking torque application</td></tr><tr><td>Z1-Z2</td><td>Delayed braking</td></tr></table></td></tr>
<tr><td>CSH
  </td><td>6 L</td><td>200 bars</td><td>SHD5 - SHD9</td><td>• Vertical installation - Weight without oil = 62 kg
• Customer-fitted solutions
• MOPS: Application of full braking force
Adjustable and progressive application fo the braking force with non-application of the full braking force at beginning of the braking
• Electrical indicators (clogging, oil temperature and level)</td></tr>
<tr><td>CE8L
  </td><td>8 L</td><td>225 bars</td><td>SHD2 - SHD5
SH5 - SH9
SH15 - SH18B
SH25
TH9</td><td rowspan="2">• Horizontal or vertical installation
• Weight without oil CE8L = 54 kg / CE12L = 66 kg
• Options:
<table><tr><td>MS</td><td>Motor 290/500VAC 50Hz or
Motor 230/400 VAC with PTC sensor</td></tr><tr><td>EVS</td><td>EV coils voltage different from the standard</td></tr><tr><td>OP1</td><td>Integrated electrical power unit</td></tr><tr><td>CS2EV</td><td>Enhanced security return circuit by 2 solenoid valves</td></tr><tr><td>OP1-OP2</td><td>Monitoring device of the 2 solenoid valves (of OP1)</td></tr><tr><td>OP1-OP3</td><td>Manual lowering with a dead man safety device.</td></tr><tr><td>K1 ou K2</td><td>Manual lowering with overspeed safety</td></tr><tr><td>OP4</td><td>Indicator switch of the position of the control valve(s)</td></tr><tr><td>OP5</td><td>Visual or electrical clogging Indicator</td></tr><tr><td>OP6</td><td>HPP for iron and steel industry</td></tr><tr><td>OP8</td><td>Electrical indicator of oil minimum level</td></tr><tr><td>OP10</td><td>Drip tray for horizontal HPP</td></tr><tr><td>RV</td><td>Drain valve for reservoir</td></tr><tr><td>Y5</td><td>Regulated braking</td></tr></table></td></tr>
<tr><td>CE12L
  </td><td>12 L</td><td>225 bars</td><td>SH15 - SH18B
SH25 - SH32</td></tr>
<tr><td>SB210
  </td><td>63 L</td><td>225 bars</td><td>SH15 - SH18B
SH25 - SH32</td><td>• Vertical installation - Weight without oil = 125 kg
• Options:
MS / EVS../ OP1 / OP2 / OP3 / OP4 / OP6 / OP5 / OP7-8
OP9: Output pressure switch
Electrical power unit integrated to the HPP
Electrical indicators: clogging, oil level and temperature...</td></tr>
</table>

CONTROL AND SAFETY SYSTEMS

Safety systems

BRAKING SOLUTIONS FOR	APPLICATIONS
• HOISTING SPEED MONITORING • BRAKING SYSTEM CONTROL • REGULATED DECELERATION • SPEED REGULATION / CONSTANT DECELERATION • SAFETY PERFORMANCE LEVEL PL d to PL e	• MASS TRANSPORTS: CABLEWAY, PASSENGERS ELEVATORS FUNICULARS, CHAIRLIFTS... • STEEL INDUSTRY LADLE CRANE • BELT CONVEYORS

SIoT
INTELLIGENCE FOR YOUR PERFORMANCE

SIoT concept includes several modules, each having specific functions:

Sideos: Speed MONITORING
Siman: HPP CONTROL & MONITORING
Sireg: Regulated Braking CONTROL
Sibrake: Brake MONITORING
Switches: Lifting MONITORING
Sibus: Information Exchange
Sinet: Data process & communication

Consult us.

SIDEOS One
Speed MONITORING

- **SIDEOS One** is designed to monitor:
  - 3 speed thresholds,
  - stop of the installation
  - rotation direction of the installation
- **SIDEOS One** detects overspeed, static and dynamic slipping

SIDEOS SC
Variable Speed MONITORING

- **SIDEOS Sc** is designed to monitor the speed according to a variable speed threshold (ex. control with joystick)
- **SIDEOS Sc** detects overspeed or underspeed, static and dynamic slipping

SIMAN
Safety Intelligent MANager of the Hydraulic Power Packs

- SYSTEM of MANAGEMENT, MONITORING and SAFETY of the HPP with Ethernet connection (in option)
- **SIMAN SAFETY**: Safety functionalities
- **SIMAN ADVANCED**:
  General functionalities
  Operation monitoring

SIDEOS V4
Kinematic Chain MONITORING

- **SIDEOS V4** is a CONFIGURABLE MONITORING SYSTEM
- secures the kinematic chain of the lifting equipment
- can be used in Drum/Motor or Drum/Drum configurations

AFR5
Automatic Lowering CONTROL

- MONITORING & CONTROL SYSTEMS for regulated braking adapted to the customer installation.
- includes:
  - **SIDEOS** system(s)
  - **CRD®** deceleration regulation module(s)
  - **CRV®** speed regulation module(s)

Safety systems

SAFETY AND CONTROL SYSTEM - SIMAN

Revision number: T10163-02-A **Revision date: 04.03.2021**

PRESENTATION

The **SIMAN** (**S**afety **I**ntelligent **MAN**ager) s a hydraulic power pack safety manager (see **SHPU** leaflets quoted in bottom page), it allows to drive, monitor and securise:

> Safety functionalities (**SIMAN SAFETY**):
- Checking of braking possibility
- Detection of locked solenoid valves
- Overpressure detection in Lowering/Regulation mode
- Internal faults detection

> General functionalities (**SIMAN ADVANCED**):
- Advanced braking functions (Delay, Lowering/Regulation, Soft Braking/Step Braking, MOPS)
- Advanced diagnostics
- Settings profiles (customizables)
- Up to 2 separated hydraulic circuits
- Up to 5 independent solenoid valves with possible eco mode
- 5 assignable detection levels
- Command problems detection
- USB Data exchange (Languages/Settings/Records)

> Operation monitoring (**SIMAN ADVANCED**):
- Over/under pressure detection
- 2 leakages detection levels
- Hydraulic power pack sensors connections
- Motor pump group protection

> Options:
- Inter-products communication (**SIoT**)
- Multiple solenoid valves voltages (**MEVO** module)

NOTE

SAFETY configuration only allows to reach a safety level according to EN ISO 13849-1.
A **SIMAN** supplied with **ADVANCED** configuration allowing standard operation of most installations, does not provide a safety level according to EN ISO 13849-1.

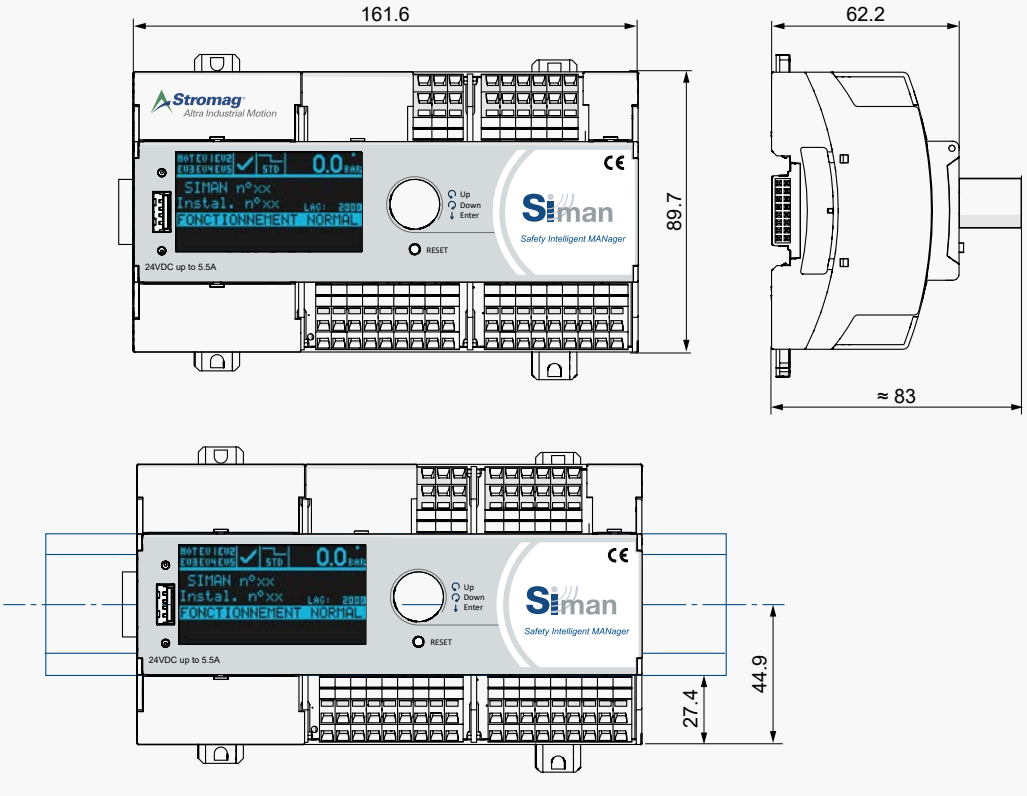
MECHANICAL FASTENING

The **SIMAN** must be mechanically mounted on a rail according to DIN 43880.

ELECTRICAL CONNECTIONS

All **SIMAN** electrical terminals have the following characteristics:

Conductor		section in mm²
rigid	min	0,2
	max	2,5
flexible	min	0,2
	max	1,5
flexible with end without insulating inlet cone	min	0,25
	max	1,5
flexible with end with insulating inlet cone	min	0,25
	max	1,5
AWG conductor cross section	min	24
	max	14



SAFETY AND CONTROL SYSTEM - SIMAN

Revision number: T10163-02-A **Revision date: 04.03.2021**

For a detailed description of the SIMAN functionalities, consult the complete technical leaflet at: download.stromagfrance.com

SAFETY

Implementation

The machine manufacturer is responsible for the implementation. For installation, use and checks, it is recommended to take into account this document instructions and also the standards, prescriptions, national or international rules and directives that apply in particular:
Machinery directive 2006/42/EU
Low voltage directive 2014/35/EU
EMC Electromagnetic compatiblity 2014/30/EU

Operation category according to EN ISO 13849-1

The **SIMAN** is a safety manager system for the HPP of the emergency braking system that acts directly on the dangerous phenomena that may occur in an unexpected way (crash risk due to a load fall), it is intended to be used in a part of the control circuit relating to safety (goods and people protection).

It allows to obtain a secured emergency braking control system of category 2 and a performance level PL=d according to the standard ISO/IEC 13849-1.
The control system of the **SIMAN** system faults allows to detect during operation all faults that may lead to the loss of safety function.

Safety data (according to EN ISO 13849-1)

Performance level	**PL**	PLd
Category	**Cat.**	Category 2
Mean Time To hazardous Failure	**MTTFD**	178 years
Average probability of dangerous failure per hour	**PFHD**	PFHD = 2,29 x 10-7
Mission duration	**TM**	20 years
Stop category		Mechanical type 0
Calculation	**PFHD**	500 000 operations / year (1369 / day)

HUMAN / MACHINE INTERFACE

The **SIMAN** has a man/machine interface fitted with a screen, an encoding wheel for navigation in the various menus, a USB port as well as a RESET button for resetting the system.

Encoding wheel

The encoding wheel allows navigation in the different menus and sub-menus of **SIMAN**.
Pressing it once allows validation, pressing it for an extended time allows access to the advanced functions, turning it anticlockwise allows going up, and turning it clockwise allows going down.

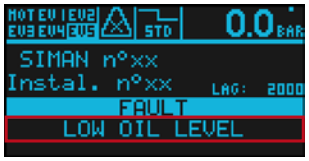
USB port

The USB port of **SIMAN** allows several functionalities: importing language files, recording the operation of the hydraulic braking system on the installation as well as importing/exporting a configuration.

Screen

Events description:

Screen - Detection description

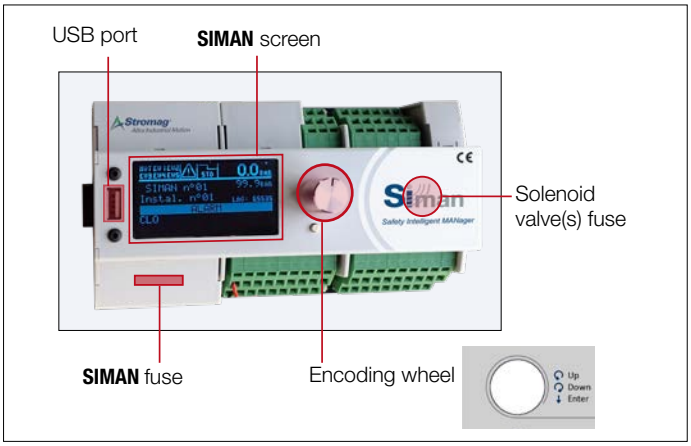


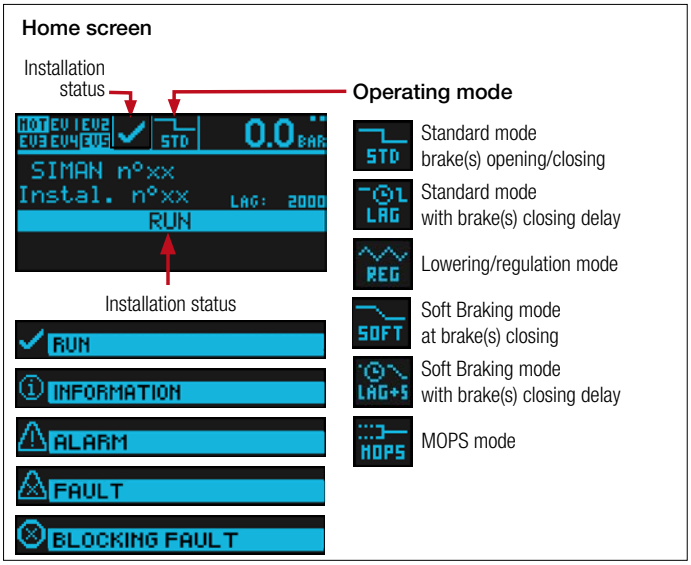
For more details on the current event, press briefly on the encoding wheel.

Events history

A history of the last hundred events containing all the detections is available under:

MAIN MENU ➔ EVENT HISTORY ➔





SAFETY AND CONTROL SYSTEM - SIMAN CM

Revision number: M10163-03-A **Revision date: 13.12.2021**

PRESENTATION

The **SIMAN CM** (**SIMAN C**ommunication **M**odule) is an optional module for the SIMAN (Safety Intelligent MANager) allowing its connection to an Ethernet network.

Features:

> ModBus TCP Server (Slave)

> WEB server including :
- **SIMAN** dashboard
- **SIMAN CM** administration

NOTE !

The **SIMAN CM**, by its design, can only read information contained in a SIMAN. It cannot modify the SIMAN's parameters or impact its operation.

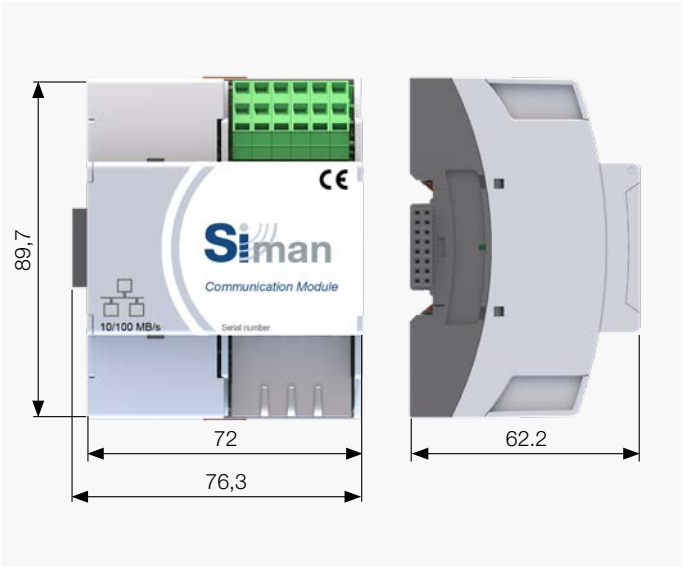
Thus, the **SIMAN CM** has no security impact on the SIMAN.

DANGER !

Safety depends directly on the configuration of the SIMAN. In order to ensure maximum safety, it must be adapted to the installation.
Before use, make sure that the SIMAN leaflet (see reference below) is taken into account by a qualified person in the fields of electronics/electrics, hydraulics and mechanics.

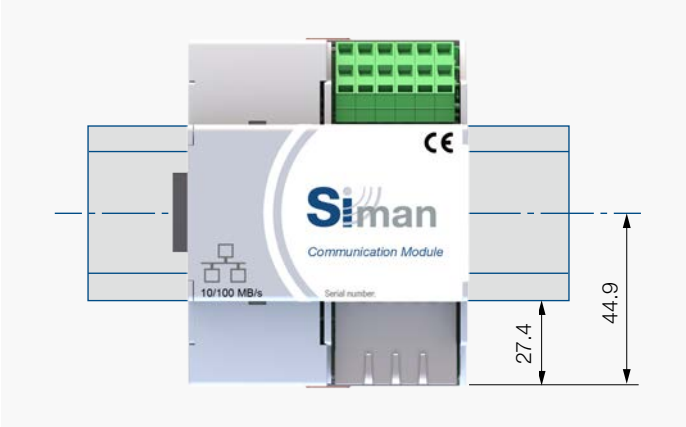
TECHNICAL CHARACTERISTICS

Dimensions



Mechanical mounting

The **SIMAN CM** must be mechanically mounted on a rail according to DIN 43880.

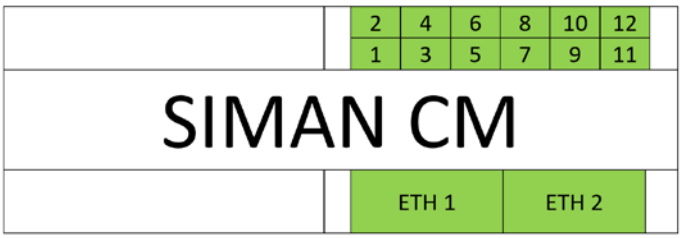


Electrical connections

All the terminals for the **SIMAN CM** electrical connections have the following characteristics:

Conductor		section in mm²
rigid	min	0,2
	max	2,5
flexible	min	0,2
	max	1,5
flexible with ferrule without insulating entry cone	min	0,25
	max	1,5
flexible with ferrule and insulating entry cone	min	0,25
	max	1,5
Conductor section AWG	min	24
	max	14

Disposition des bornes de raccordement:



1 – Output 24V 2 – 0V 3 – IN 1 4 – IN 2 5 – Output 24V 6 – 0V	7 – RL1 NO 8 – RL2 NO 9 – RL1 C 10 – RL2 C 11 – RL1 NC 12 – RL2 NC	ETH1 – Ethernet port 1 ETH1 – Ethernet port 2

The two Ethernet ports form an internal switch and are on the same network. They can, for example, be used to perform a "chaining".

SAFETY AND CONTROL SYSTEM - SIMAN CM

Revision number: M10163-03-A **Revision date: 13.12.2021**

CONNECTION to SIMAN and POWER SUPPLY

The **SIMAN CM** must be connected to one and only one SIMAN via the DIN rail backplane connectors supplied with the **SIMAN CM**. This connection allows both the power supply of the **SIMAN CM** and the collection of information from the SIMAN.

INPUTS / OUTPUTS

The **SIMAN CM** has two 24V discrete inputs and two relay outputs. These are configurable via the WEB interface and can be read and controlled via ModBus TCP. They are independent of the SIMAN.

WEB INTERFACE

The **SIMAN CM** has a WEB interface allowing the visualization of the information coming from the SIMAN as well as the configuration of the **SIMAN CM**.

The **SIMAN CM** is configured by default with the following IP address: 192.168.1.250/24.
In order to integrate the **SIMAN CM** in a network, it is necessary to modify this configuration via the WEB interface.

ModBus TCP

The **SIMAN CM** includes a ModBus TCP server (Slave). The slave address is set to the value 1.

The server consists of 5 sockets allowing up to 5 simultaneous connections. These sockets all use port 502 by default. The port used can be changed independently for each socket via the WEB interface (a port set to the value 0 disables the socket).

For a detailed description of the SIMAN CM functionalities, consult the complete technical leaflet at: download.stromagfrance.com

For control, monitoring and safety functions, SHPU2 and SHPU3 Hydraulic Power Packs can be equipped with a **K-SI** electrical unit. This electrical unit includes a **SIMAN** (Safety Intelligent MANager) and optionally :

- 1 power supply 24VDC 5A or 10A
- 1 **SIMAN CM** (**SIMAN C**ommunication **M**odule) allowing the connection of the SIMAN to an Ethernet network
- 1 **MEVO-5RL** allowing the use of solenoid valve coils other than 24VDC, consult us.

Its operation and characteristics directly depend on the **SIMAN.**

K-SI CM MEVO

Safety systems

SPEED MONITORING SYSTEM - SIDEOS ONE

Revision number: M10054-01-G **Revision date: 21.10.2020**

Configurable and secure system for speed monitoring: redundant design and fault detection system (DC>99%) which secure the overall operation of the overspeed detection system.

Conform to the machine security standards:
NF EN ISO 13489-1
Performance level PL=d to PL=e
Category: 2 to 4
$MTTF_D$ = 230.9 years PFH_D = 1460 operations/year

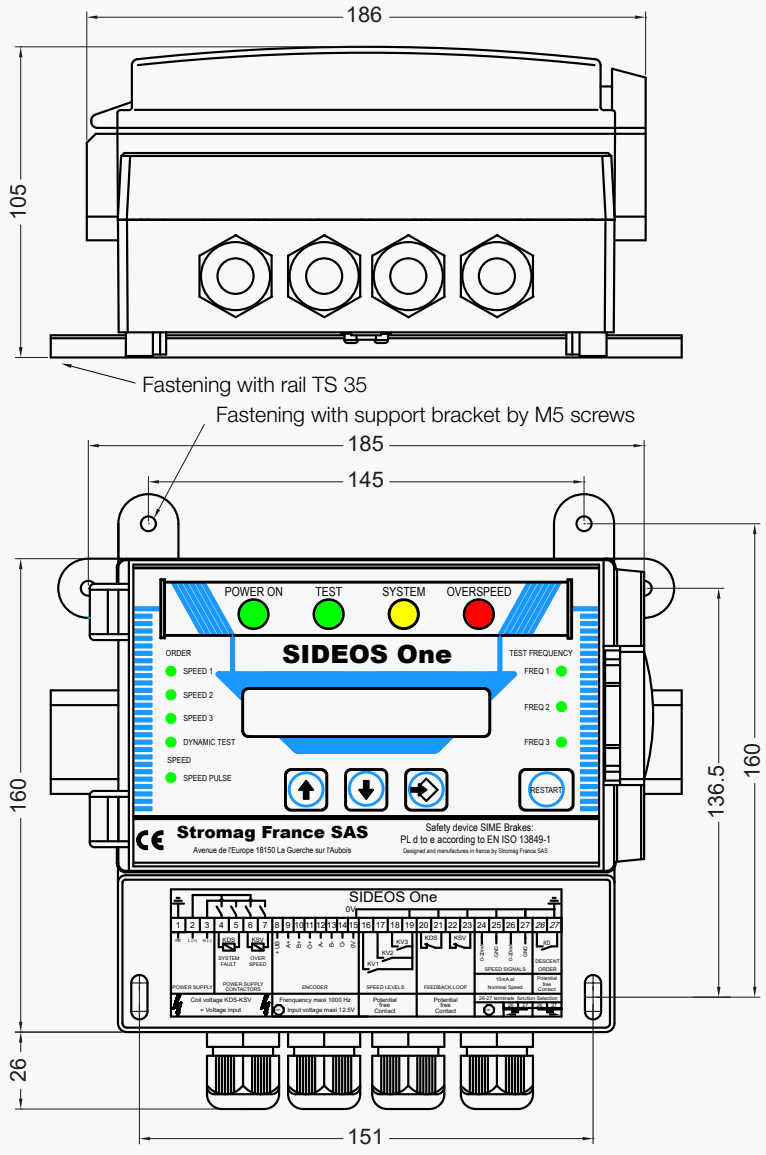
Operating conditions:
- Ambient temperature: -20°C to +60°C
  Attention: Using **SIDEOS One** at temperature > 60°C involves destruction of the internal power supply
- IP65 protected electrical casing

Electrical data:
- 2 versions
  AC: 115/230 VAC ± 10% 50/60Hz or
  DC: 24 VDC ± 15%
- Other voltages: consult us

EC marking of conformity:
- 2006/42/EC directive Machine
- 2014/35/UE Low voltage directive (standard NF EN 60204-1)
- 2014/30/UE EMC directive (standards NF EN 61000-6-2. NF EN 61000-6-4)

Options:
- Steel casing IP66 IK10
- Contact module

The **SIDEOS One** can be installed in a control enclosure on an DIN rail of 35mm, or fixed with M5 screws, see the drawing below.



4 cable glands ISO20 cable Ø 6 to 12
En case of heavy vibrations, it is recommended to fasten the SIDEOS One on elastic buffers

SPEED MONITORING SYSTEM - SIDEOS ONE

Revision number: M10054-01-G **Revision date: 21.10.2020**

For a detailed description of the **SIDEOS One** functionalities, consult the complete technical leaflet at: download.stromagfrance.com

The **SIDEOS One** is a configurable system for speed monitoring designed to secure the lifting of a handling equipment.

> **It is set according to**:

- The lifting characteristics	**Parameters**
• Number of encoder pulses per revolution	NC
• Nominal speed of lifting in rpm	NS
• Deceleration time	DT
- The selected functions	
• Speed thresholds to monitor	SP1-SP2-SP3
• Dynamic Slipping	TS
• Break of the kinematic chain	TS and DS
• Encoder monitoring	RC
- The number of pulses to confirm an Overspeed	
• Validation Overspeed 1, Static and Dynamic Slippings	VS1
• Validation Overspeed 2	VS2
• Validation Overspeed 3 and kinematic chain break	VS3

Access to the parameters is protected by a locking mode.

> **It receives:**
- The speed signal(s) of the installation
- The functional orders of the lifting control of the handling equipment

> **It monitors:**	**and detects, in case of wrong operation:**
- the lifting speed(s)	- an Overspeed
- the lifting stop (deceleration) - the lifting stop positioning	- a Static Slipping - a Static Slipping
- the lifting operation direction	- a Dynamic Slipping
- the lifting kinematic chain	- a Differential Speed
- the encoder	- an encoder fault
- the functional orders of the control	- a Speed contact fault
- the output contactors or relays	- a contactor fault

> **When it detects a fault, it cuts:**
- the power to the relevant outpout, System Fault or Overspeed

> **It secures the global operation of the speed monitoring system by means of:**
- its redundant internal and external design and its monitoring system (DC> 99%) which allow the detection of all the internal and external failures.

It allows to obtain
a secured speed monitoring system
Category 2 PL d up to Category 4 PL e
according to the standard NF EN ISO 13849-1.

> **It signals the triggering origin:**
- via the alphanumeric display
- an auxiliary contact of the output contactors

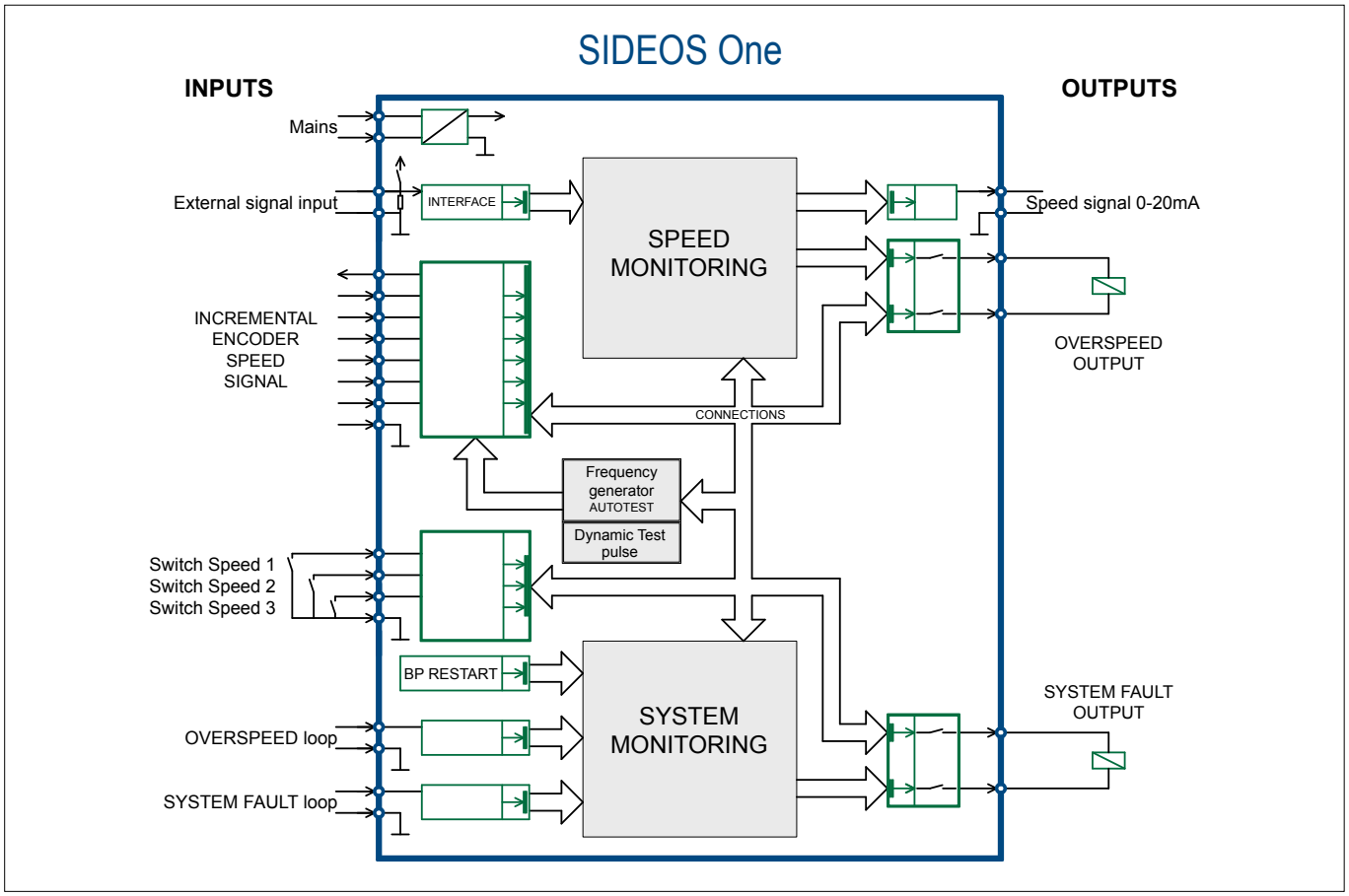
> **It records:**
- The opening of the output contactors or relays and this even in case of power cut
- The 3 last Fault message

> **It releases:**
- the fault when the RESTART button is manually actuated, this action allows the control system to receive a distinct starting order.

SPEED MONITORING SYSTEM - SIDEOS ONE

Revision number: M10054-01-G **Revision date: 21.10.2020**

Internal design



> **External failures**

The monitoring system of the **SIDEOS One** is designed to detect all the external signals failures by means of a redundant or logic treatment of the input signals.

It secures the operation of the speeds inputs, the contacts inputs, the System Fault outputs and the Overspeed outputs (DCavg>99%).

> **Internal failures**

The **SIDEOS One** detects all the internal faults (DCavg>99%), either during the operation, or during the AUTOTEST.
Faults, detected only during the AUTOTEST, do not lead to loss the safety function thanks to the redundant internal design.

It ensures:
- a cross-monitoring of its internal operation
- a dynamic test of the overspeed function every 360 pulses of the encoder
- the control of validity of the memories

> **Cut-off and safe connection of the System Fault and Overspeed outputs supply**

The **SIDEOS One** system, that cuts off the supply of the System Fault and Overspeed outputs, is designed to switch off the output supply whatever the fault present on the output.

> **Autotest**

The Autotest triggers automatically at power on (time 1.5s) or at a manual starting-up (RESTART) following a triggering of a **SIDEOS One** output (time 1s).

The AUTOTEST allows a global checking and ensures the **SIDEOS One** to operate correctly, if the AUTOTEST is validated.

SPEED MONITORING SYSTEM - SIDEOS SC

Revision number: M10164-01-B **Revision date: 23.03.2021**

For a detailed description of the SIDEOS Sc functionalities, consult the complete technical leaflet at: download.stromagfrance.com

The **SIDEOS Sc** is a configurable system for speed monitoring designed to secure the lifting of a handling equipment.
It compares the speed (encoder) with the speed controller setpoint.
Its dimensions, operating conditions, electrical data and EC marking of conformity are identical to Sideos One.

> It is set according to:

- The lifting characteristics	**Parameters**
• Number of encoder pulses per revolution	NC
• Nominal speed of lifting in rpm	NS
• Deceleration time	DT
• Acceleration time	AT
- Parameterization of the monitoring	
• Number of validation pulses of a Static or Dynamic Slipping (2 to 10°)	VS1
• Number of validation pulses of a underspeed / overspeed (10ms to 40ms at NS)	VS2
• Underpeed ans overspeed threshold in % of NS (10 to 25%)	DS
• Direction of rotation encoder (Dynamic Slipping)	DRe
- Parameterization of the signal output	
• Type of Signal on the signal output 0-20mA	OS

Access to the parameters is protected by a locking mode.

From:
- Functional commands transmitted to the speed controller
- From the speed setpoint transmitted to the speed controller
- Brake release signal (opening contact or controller control)
- The winch speed from an incremental encoder

> It monitors:	**and detects, in case of wrong operation:**
- the lifting speed	- an Underspeed or an Overspeed
- the lifting stop (deceleration)	- a Static Slipping (Deceleration fault)
- the lifting stop positioning	- a Static Slipping (Load slip)
- the lifting operation direction	- a Dynamic Slipping
- the encoder	- an Encoder fault
- the functional orders of the command	- a Speed contact fault
- the output contactors or relays	- a contactor fault

> When it detects a fault, it cuts:
- the power to the relevant outpout, System Fault or Overspeed

> It secures the global operation of the speed monitoring system by means of:
- its redundant internal and external design and its monitoring system (DC> 99%) which allow the detection of all the internal and external failures.

It allows to obtain
a secured speed monitoring system
Category 3 PL d up to Category 4 PL e
according to the standard NF EN ISO 13849-1.

> It signals the triggering origin:
- via the alphanumeric display
- an auxiliary contact of the output contactors

> It records:
- The opening of the output contactors or relays and this even in case of power cut
- The 3 last Fault message

> It releases:
- the fault when the RESTART button is manually actuated, this action allows the control system to receive a distinct starting order.

Safety systems

KINEMATIC CHAIN MONITORING SYSTEM - SIDEOS V4

Revision number: M10162-01-C **Revision date: 12.09.2019**

- Configurable Monitoring System of the kinematic chain (SSCC) designed to secure the kinemetic chain of a handling equipment (lifting).
- Independent monitoring system of the speed of a handling equipment (lifting).
- It drives the opening of the braking control circuit downstream of the control-command circuits which it depends on.
- It prevents or stops use of the lifting motion of the handling equipment, if it cannot perform its function.

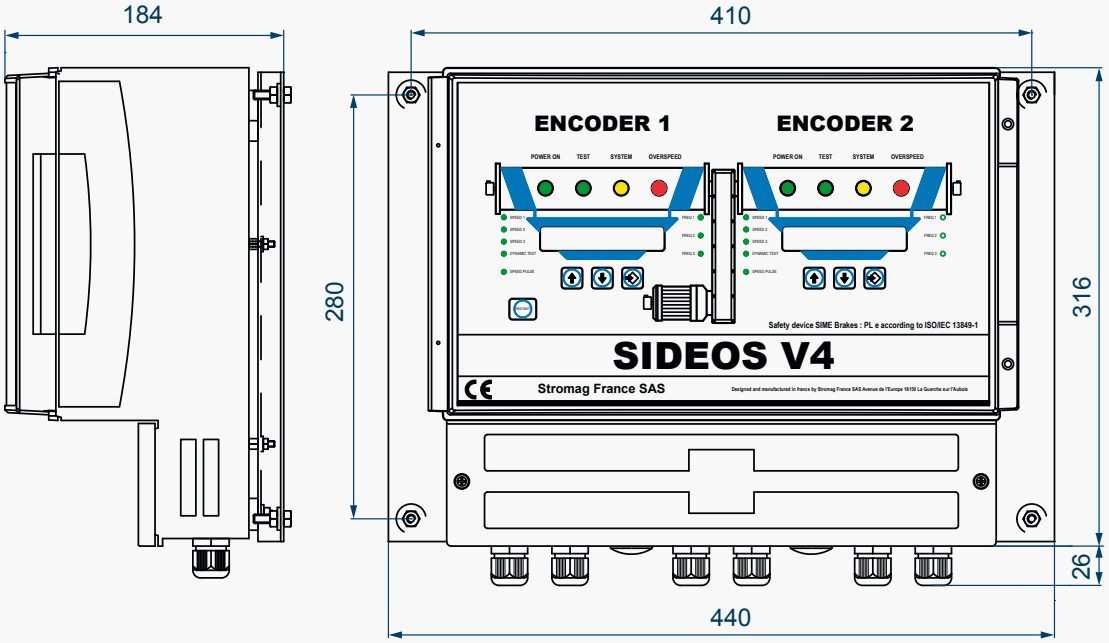
Conform to the machine security standard:
ISO/IEC 13849-1
Category 4 Performance Level PL= e
Designed according to CRT16 60.C.016 EDF

- a single fault in any of its parts does not involve a loss of the safety function.
- a single fault is detected as soon as or before the safety function is next required.
- faults accumulation is taken into account.
- the average rate before failure of the **SIDEOS V4** subsystem is high: MTTFD = 172.4 years.
- the probability of dangerous failure per hour (1/h) of the **SIDEOS V4** subsystem is: PFHD =1.35 10-8.
- the diagnosis coverage is high (DCavg ≥99%).
- the failures detection rate of Common Cause CCF ≥ 80%.
- the assignment time TM = 20 years

Operating conditions:
- Ambient temperature: -20°C to +60°C

Electrical data:
- DC: 24 VDC ± 15%
- Other voltages: consult us

EC marking of conformity:
- 2006/42/EC directive Machine
- 2014/35/UE Low voltage directive (standard NF EN 60204-1)
- 2014/30/UE EMC directive (standards NF EN 61000-6-2. NF EN 61000-6-4)



Casing material	Polycarbonate
Cables inputs	6 x cable glands ISO 20 (Ø cable min. = 6 mm / max. = 12 mm) 2 stopping plugs ISO 25
Casing protection rate	Casing IP65
Impact resistance	IK 08/07
Mounting	Screws M6 provided (Screw M6x20 – pin washers – nut M6).
Weight	8 Kg

MOUNTING INFORMATION

> The metal support of the **SIDEOS V4** casing must be connected to the surrounding metal structure.

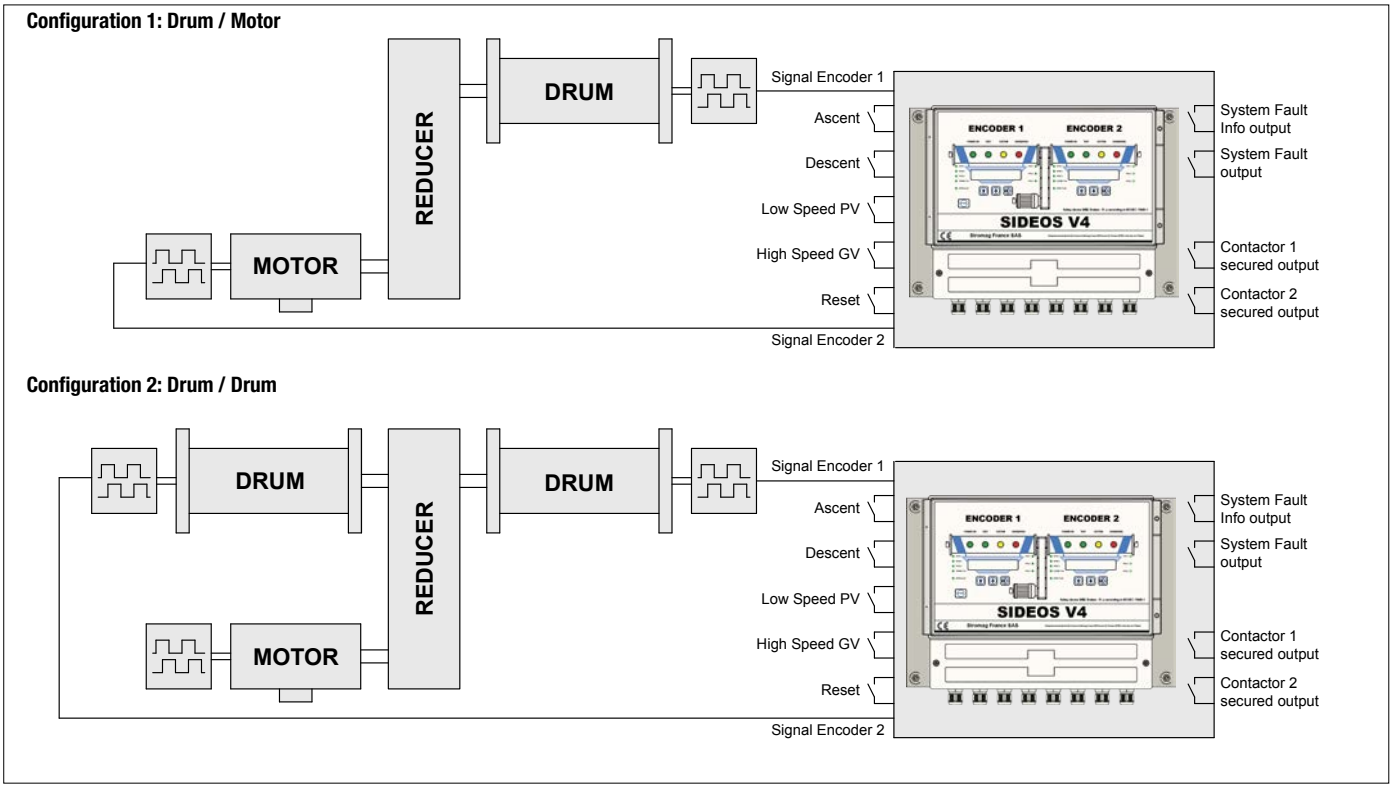
> Use the provided screws to make the electrical and mechanical connection.
If necessary, use also a ground strape.

KINEMATIC CHAIN MONITORING SYSTEM - SIDEOS V4

Revision number: M10162-01-C **Revision date: 12.09.2019**

For a detailed description of the SIDEOS V4 functionalities, consult the complete technical leaflet at: download.stromagfrance.com

The **SIDEOS V4** unit is a configurable Monitoring System of the kinemetic chain (SSCC) designed to secure the kinematic chain of handling equipment (lifting).
It can be used in the 2 following configurations:



> **It is set according to the lifting characteristics**:
- Characteristics on Encoder N°1 side
- Characteristics on Encoder N°2 side

> **It receives**:
- the speed signals from the 2 incremental encoders
- the functional orders of the lifting control of the handling equipment
- the position of the brake control contactors via contacts NC mechanically linked to the power contacts.

> **It monitors the lifting speed and detects the faults following the orders it receive**:
- Faults of lifting speed.
  Overspeed PV and GV – Kinematic chain breaking
  Static Slipping – Dynamic Slipping
- Extrenal system faults
  Encoders – Speed contact – Contactors.
- Internal system faults
  Failure of the **SIDEOS V4** system.

> **In case of Speed or System fault, it drives:**
- the opening of the braking control circuit downstream the control-command circuits via 2 secured output contacts.

> **It transmits to the control-command**:
- the copy of the secured output contacts by making the difference between the opening due to a System fault or a Speed fault.

> **It signals to the operator**:
- the triggering origin via alphanumeric displays.

> **It records**:
- the opening of the output contacts even in case of a mains failure
- the 3 last fault messages.

> When powering on the **SIDEOS V4** or when a RESTART is requested (fault acknowledgment), **it makes a complete AUTOTEST** allowing:
- to test all the checking functions of the safety chain by simulating the System and Overspeed faults, without making a shunt,
- to detect all the internal failures (DCavg ≥ 99%),
- the contacts closing when the AUTOTEST is validated.

Access to the parameters is protected by a password.

AUTOMATIC LOWERING CONTROL - AFR5 ENCLOSURES

Revision number: M10105-01-E **Revision date: 03.06.2015**

AFR5 control enclosures are designed for controlling and monitoring regulated braking systems. They are custom designed to meet the exact needs of the installation.

They allow different braking modes:

- Constant deceleration (**CRD®** module)
  ex.: Cableway: Pic du Midi (Bagnères de Bigorre)
- Constant deceleration and speed regulation (**CRD®** module)
  ex.: Passengers elevator: Eiffel Tower in Paris
- Normal operation (AoN) and speed regulation for load lowering (**CRV®** module)
  ex.: Steel industry ladle crane: HKM (Deuschland)

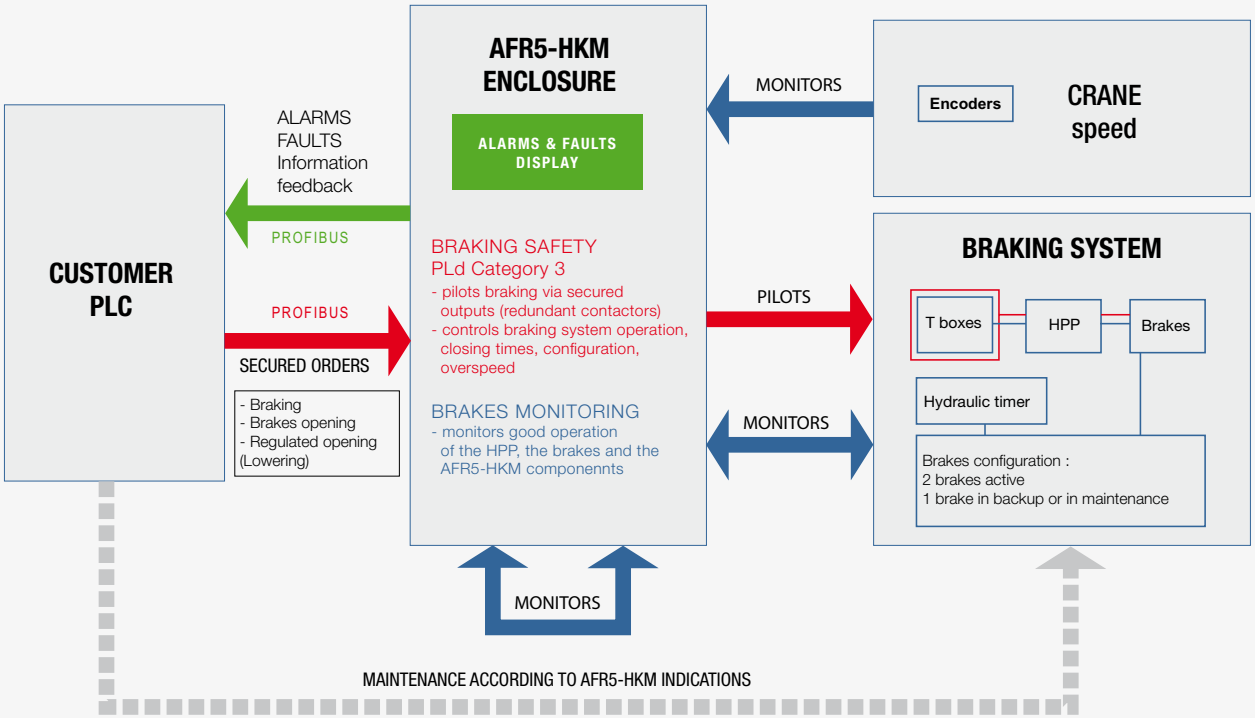
They can be designed to ensure a safety performance level up to PL d to the braking system.

They can includes:

- an Ethernet line towards the customer PLC,
- the braking management in case of power supply loss or regulated braking fault,
- the speed monitoring (**SIDEOS One**),
- the control of standby brakes or/and Hydraulic Power Packs to ensure the operation continuity in case of failure of one part of the braking system,
- a Human Machine Interface or Module.

Here is, for example, the diagram of the AFR5-HKM enclosure:
All or Nothing braking - Load lowering - Performance level PLd - Standby brakes - Data transmission to the customer PLC via ProFibus and secured ProFiBus.

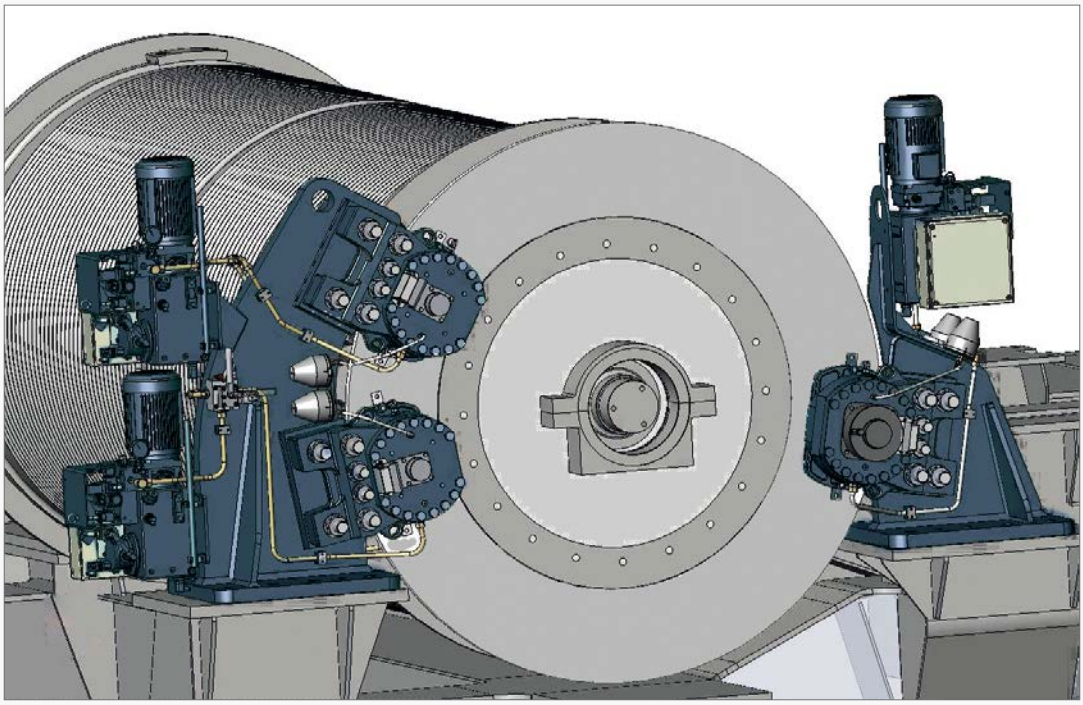
AFR5-HKM enclosure principle

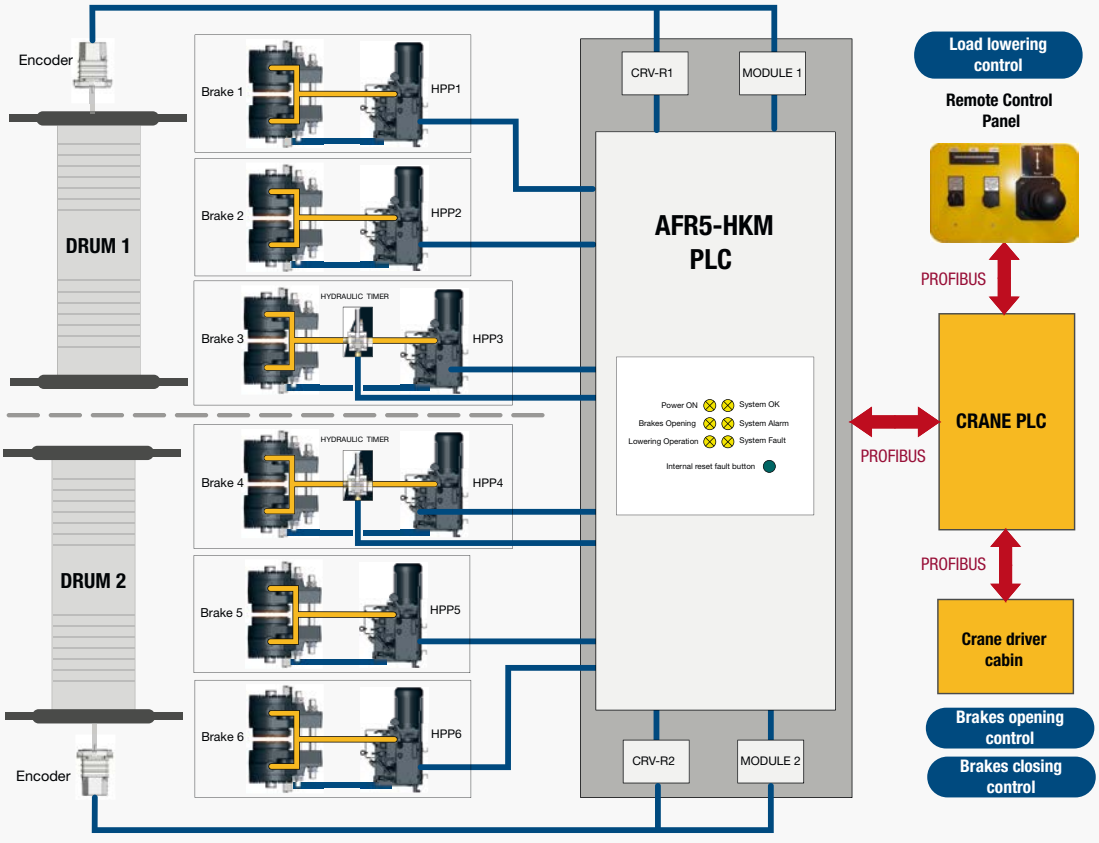


AUTOMATIC LOWERING CONTROL - AFR5 ENCLOSURES

Revision number: M10105-01-E **Revision date: 03.06.2015**

HKM Braking System monitored and controlled by AFR5-HKM enclosure



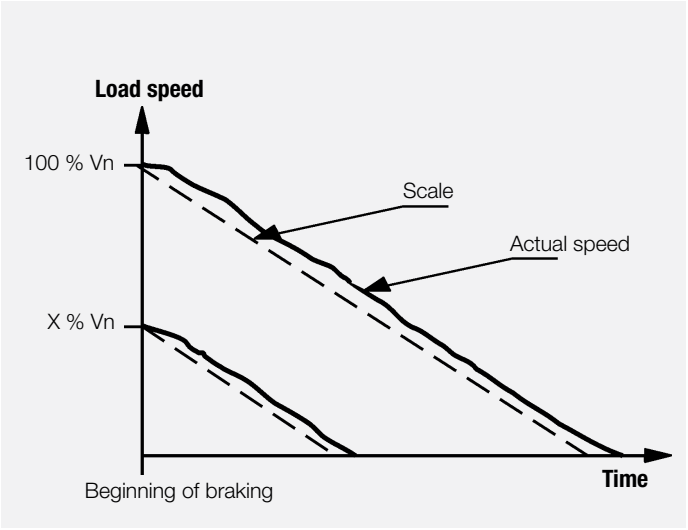


CONSTANT DECELERATION - CRD MODULE

Revision number: M08950-01-C **Revision date: 03.06.2015**

PRESENTATION

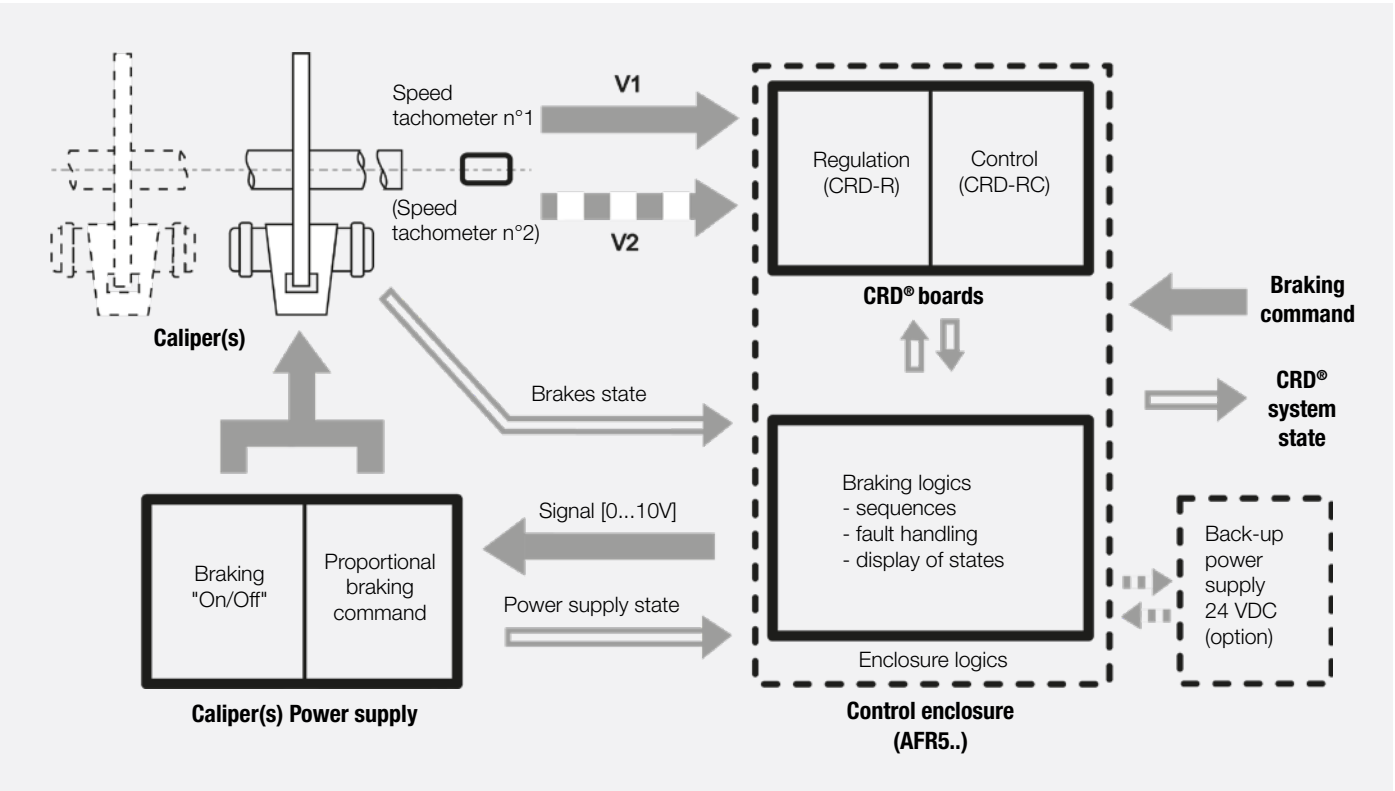
The **CRD®** module, combined with **5KE. 650E. TY5. TH** and **SH** type brakes allows a constant deceleration regulated braking whatever the speed, the load and the kind of load, driving or resisting.
CRD® board(s) are in a separate control unit or they are integrated in a control enclosure**.**
Applications: cableways, chairlifts, funiculars, lifts, belt conveyors, transporters ...



PRINCIPLE

CRD® system consists of:
- 1 or more brakes (progressive brakes type **5KE. 650E. TY5. TH** and **SH**).
- 1 hydraulic pack (**STE210Y5. CE8L-RY5**) or 1 electric power supply (AB8. ATP2. ATP24).
- 1 (or more) speed sensors (tachometric dynamo..).
- 1 **CRD®** module, it may be integrated into an **AFR5** enclosure supplied by Stromag France.

Two **CRD®** versions exist:
- **CRD-R**: a deceleration regulation board monitors power units type AB8, ATP2, ATP24 or an electronic amplifier for a proportional pressure limiter of an hydraulic power unit, customer suply the reference speed signal.
- **CRD-RC**: to the regulation board is connected a deceleration control board, fully independant from the regulation board (power suply, speed signal, scale and command).



CONSTANT DECELERATION - CRD MODULE

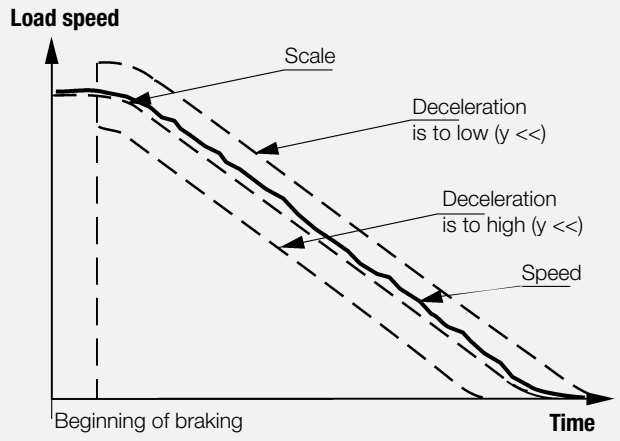
Revision number: M08950-01-C **Revision date: 03.06.2015**

For a detailed description of the CRD module features, consult the complete technical leaflet at: download.stromagfrance.com

3 - OPERATION

3-1 Deceleration regulation

CRD® module allows a deceleration regulation according to a scale at the time of a normal or an emergency braking.

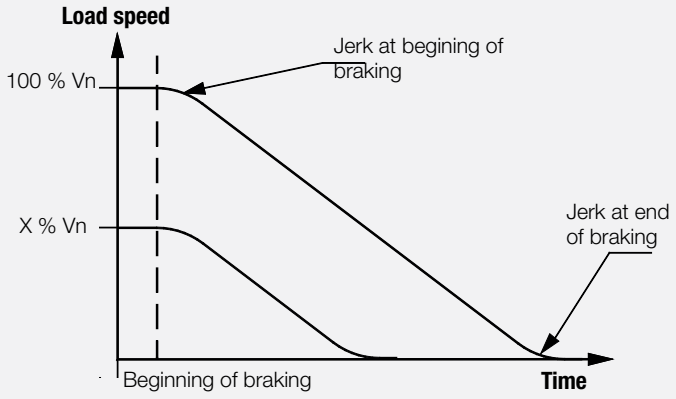


Deceleration control (CRD-RC version only)

Using a second speed sensor connected to "deceleration fault control board" insures that first board operating is correct (detected mis-functioning: braking is too low or too high, mecanical shaft or gear box failure. failure of a speed sensor or damaged wires).

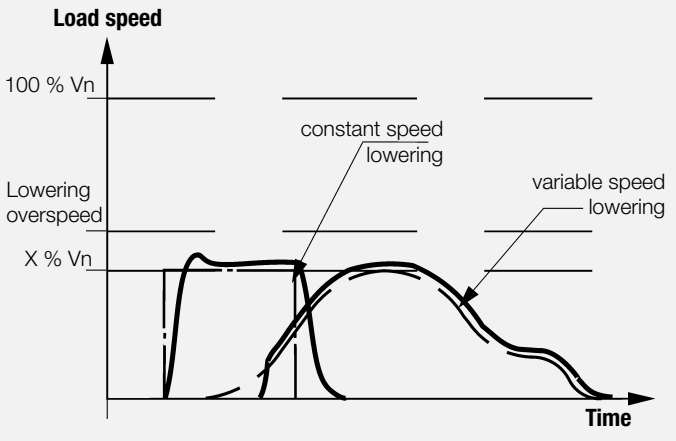
"S" curve deceleration

CRD® module allows user to select JERKS at begining and/or end of braking; duration of these "S" curves may be adjusted.



Lowering

CRD® module provides lowering function (load is let down on command after a full successful braking, for security purpose) to X % of nominal speed (setting between 5 and 20%), at constant speed, or at variable speed (operator controlled auto "0" recentering joystick).



SPEED REGULATION - CRV MODULE

Revision number: M08955-01-B **Revision date: 03.06.2015**

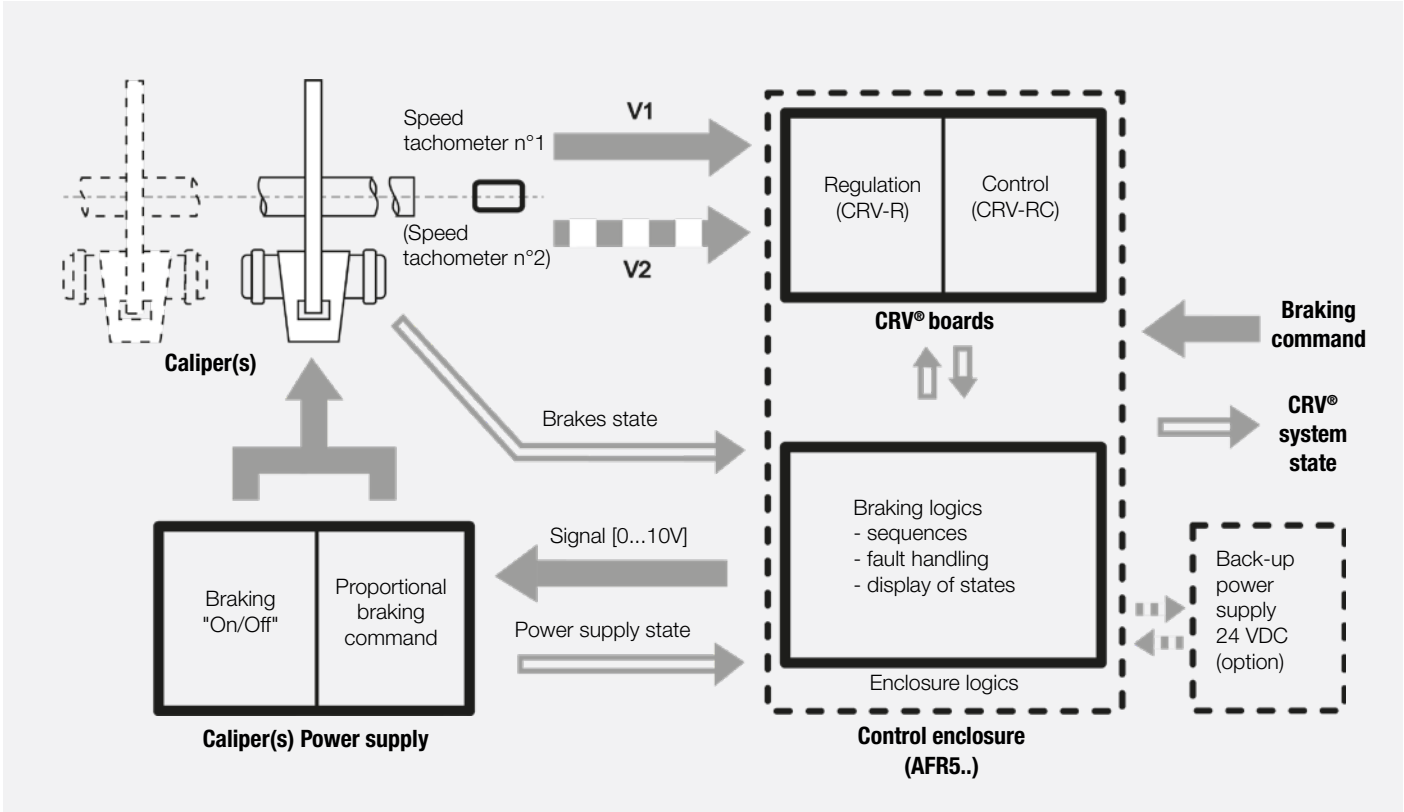
1 - PRESENTATION

Speed regulation with **CRV**, in combination with brakes type **5KE**, **650E**, **TY5**, **TH** and **SH**. provides a regulated speed braking whatever the load quantity and load specificity, pulling or resisting.
CRV® board(s) are in a separate control unit or they are integrated in a control enclosure**.**
Use: lowering, speed regulation.
Applications: cableways, chairlifts, funiculars, lifts, belt conveyors, transporters, cranes, etc...

2 - PRINCIPLE

CRV system consists of:
- 1 or more brakes (progressive brakes type **5KE. 650E. TY5. TH** and **SH**);
- 1 hydraulic pack (**STE210Y5. CE8L-RY5**) or 1 electric power supply (AB8. ATP2. ATP24).
- 1 (or more) speed sensors (tachometric dynamo..).
- 1 **CRV** module, it may be integrated into an AFR5 enclosure supplied by Stromag France.

Two **CRV®** versions exist:
- **CRV-R:** a speed regulation board monitors power units type AB8, ATP2, ATP24 or an electronic amplifier for a proportional pressure limiter of an hydraulic power unit, customer suply the reference speed signal.
- **CRV-RC:** to the regulation board is connected a speed control board, fully independant from the regulation board (power suply, speed signal, scale and command).



SPEED REGULATION - CRV MODULE

Revision number: M08955-01-B **Revision date: 03.06.2015**

For a detailed description of the CRV module features, consult the complete technical leaflet at: download.stromagfrance.com

OPERATION

Lowering

CRV module allows choosing a lowering (regulated load lowering after stop, for security purpose) at X % of nominal speed, (setting between 5 and 20%), at constant speed, or at variable speed (potentiometer with automatic "0" restoring adjusted by operator).

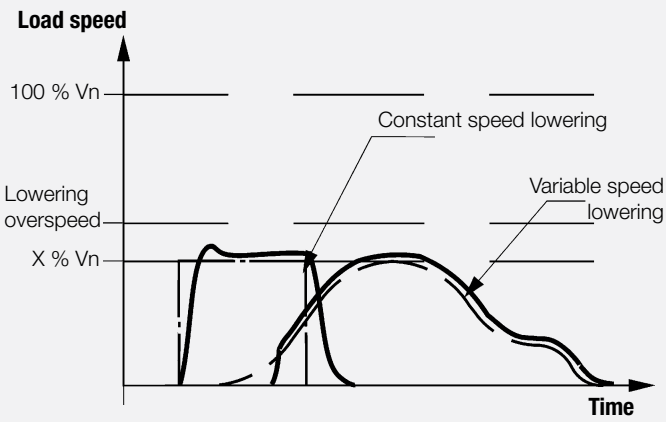
Speed regulation

CRV module allows a speed regulation set at X% of nominal speed (constant speed, factory set between 5 and 100% of nominal speed), failure of a speed sensor or damaged wires).

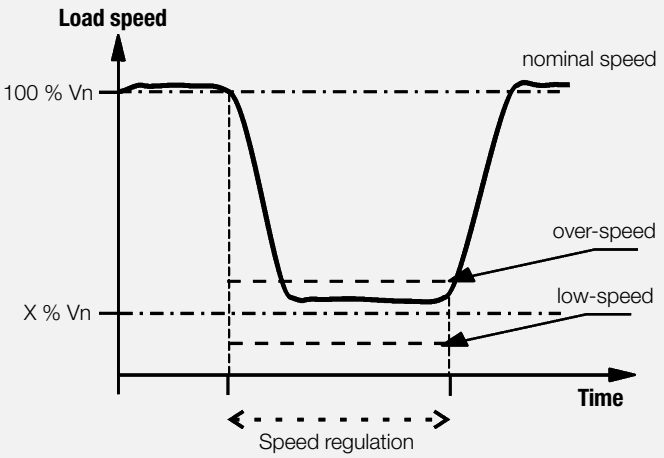
Speed control (CRV-RC only)

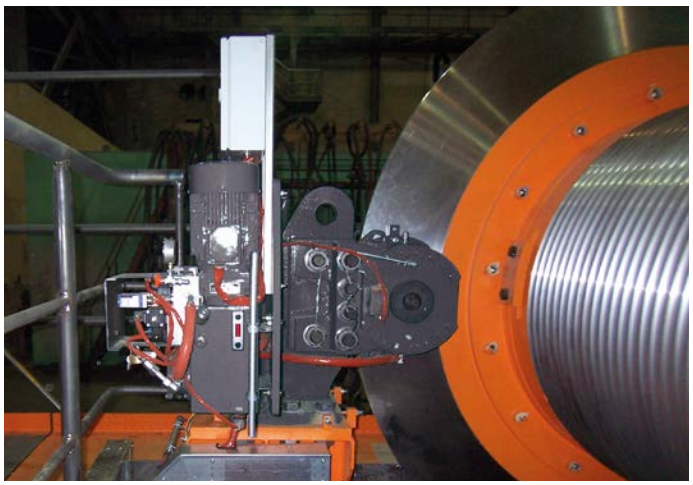
Using an additional speed sensor connected to "speed control" board allows a monitoring of the regulation (detected anomalies: speed too high or too low, mechanical breakdown of shafts or gearbox, speed sensor anomaly or damaged wiring).

Lowering



Speed regulation





DISCS

MAIN CHARACTERISTICS

- DISCS ARE AVAILABLE ALONE OR WITH HUBS
- ALL DISCS CAN BE ASSOCIATED WITH THE DIFFERENT TYPES OF FLEXIBLE COUPLINGS
- DESIGNED TO RUN AT PERMANENT TEMPERATURE OF 200°C

MONOBLOC DISCS

- Ventilated: thickness 30 mm
- Solid: thickness 15 mm
- for low energy applications.

SOLID DISCS

- Thickness 15 and 30 mm
- mounted on standard or long hub, without hub on demand
- for low energy applications.

AUTO-VENTILATED DISCS

- Thickness 30 and 42 mm
- mounted on standard or long hub, without hub on demand
- for high frequency and heavy duty braking cycles.
- high capacity of energy dissipation.

Discs thicknesses and diameters

DISCS	Diameter →	Ø 175	Ø 220	Ø 260	Ø 315	Ø 355	Ø 395	Ø 445	Ø 495	Ø 550	Ø 625	Ø 705	Ø 795	Ø 995
SOLID	Th. 15 mm	■	■	■	■		■	■	■	■	■			
MONOBLOC	Th. 30 mm		■	■	■									
VENTILATED	Th. 30 mm				■	■	■	■	■	■	■	■	■	
	Th. 42 mm										■		■	■

DISCS - GENERAL CHARACTERISTICS

Revision number: T08020-01-F **Revision date: 27.07.2017**

DISCS OF BRAKES CHARACTERISTICS

1 - Dimensions

Refer to leaflets "Technical data and dimensions" relevant to the type of disc used.
For a new disc, the tolerance of the thickness dimension is:

±0.15

2 - Materials

Ventilated discs: Cast iron type EN-GJS-400-18-LT ou EN-GJS-350-22

Solid discs: Steel S355 K2

Hubs: Steel 25/34/42CrMo4

3 - Surface quality of the contact zone with lining

(table 1)

Friction surface: Ra 1.6 to 3.2 in all directions
Centring zone: Idem

4 - Balancing

Only bare discs (except monoblocs).

Discs are balanced in "static" quality G6.3:
- at the speed of 1800 rpm for discs Ø ≤ 550 mm.
- at the maximum sped indicated in the "technical data" leaflets for discs Ø > 550 mm

The correction area is placed between the hub and the little diameter of the friction surface (see table 1).
For balancing with hub. with half-coupling or at high speed. consult us.

Table 1 - Dimensions of the friction surface

EXTERNAL DIAMETER	INNER DIAMETER				
	Thickness 15	Thickness 30			Thickness 42
	Monobloc disc	Monobloc disc	Ventilated disc	Solid disc	Ventilated disc
175	85	---	---	---	---
220	105	90	---	---	---
260	132	136	---	**---**	---
315	130	180	165	130	---
355	---	---	206	155	---
395	157	---	246	246	---
445	207	---	216	185	---
495	300	---	256	256	---
550	350	---	325	314	---
625	430	---	387	387	370
705	---	---	462	462	---
795	---	---	542	542	542
995	---	---	---	600	745

DISCS - GENERAL CHARACTERISTICS

Revision number: T08020-01-F **Revision date: 27.07.2017**

5 - Wear limit before the replacement of the disc

DANGER !

In case of an excessive wear of the disc the brake can operate out of its nominal range of setting and consequently lead to a loss of braking force.

The table 2 sums up the discs minimum thicknesses as before their replacement.

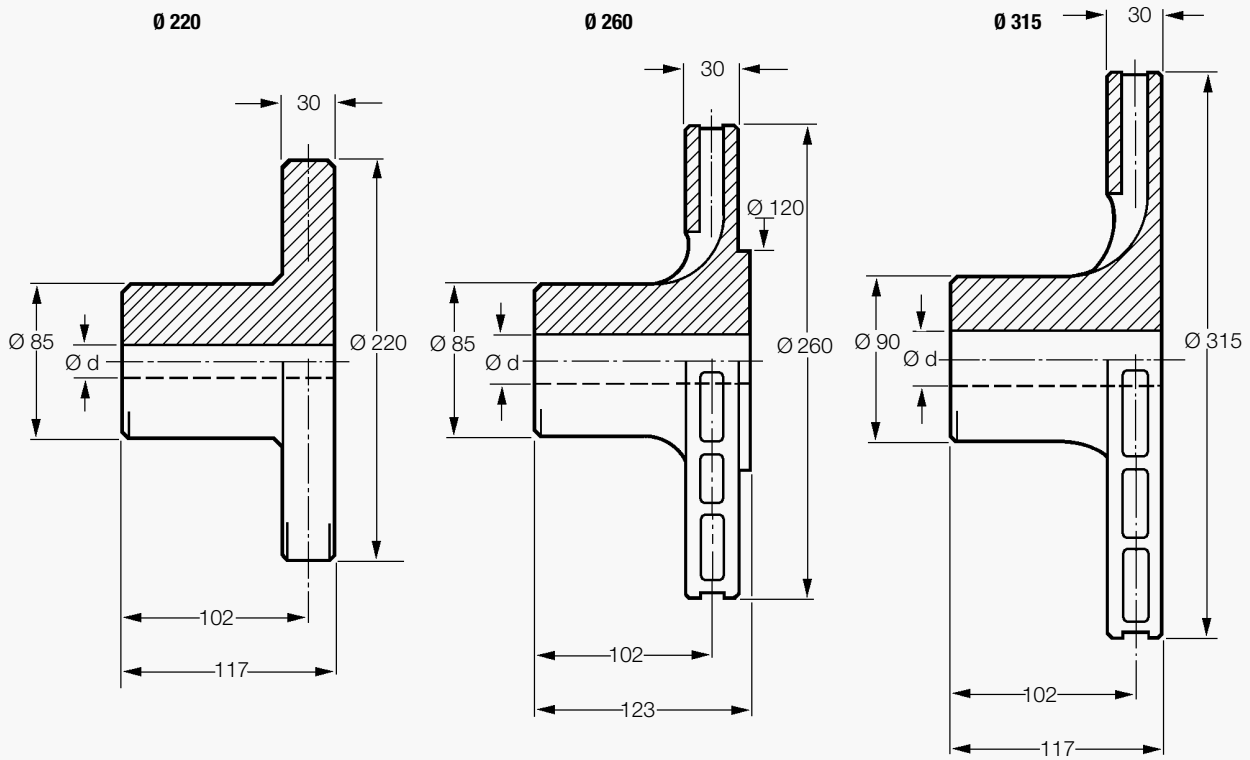
Table 2

Type of disc	Thickness unused (± 0.15)	Minimum thickness before replacement	Minimum web before replacement
	mm	mm	mm
Monobloc discs	30	27	6.5
Ventilated discs	30	27	6
	42	39	with core of 16: 11 with core of 23: 8
Solid discs	15	13	
	30	27	
	42	39	

DISCS - MONOBLOC DISCS

Revision number: T02160-01-A **Revision date: 02.05.2003**

Diametres: 220. 260 and 315 mm.
Thickness: 30 mm.

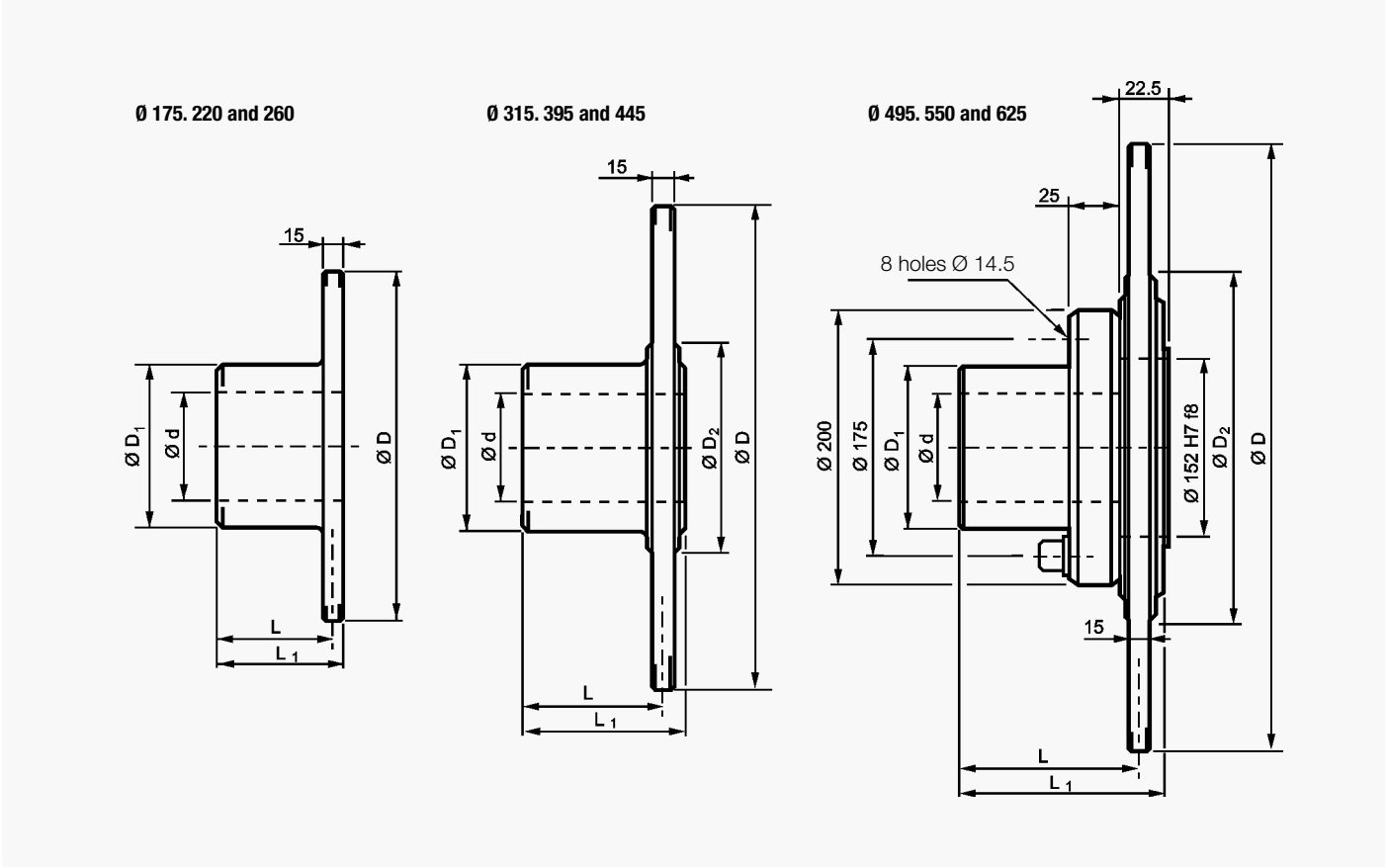


Designation		Ø	220 M 30	260 M 30	315 M30
J		kg/m²	0.055	0.070	0.14
Weight		kg	11.2	10	12
Maximum speed		rpm	4300	3600	3000
d max.	keyed	mm	55	55	60
	shrink fit	mm	55	55	60

DISCS - SOLID DISCS

Revision number: T02100-01-A **Revision date: 01.03.2001**

Thickness: 15 mm



Designation			175 P 15	220 P 15	260 P 15	315 P 15	395 P 15	445 P 15	495 P 15	550 P 15	625 P 15
J		kg/m²	0,01	0,03	0,06	0,13	0,30	0,48	0,77	1,16	1,93
Weight		kg	4	7,6	13	18	24	28	43	49	59
Maximum speed		rpm	5000	4300	3600	3000	2400	2100	1900	1800	1500
D		mm	175	220	260	315	395	445	495	550	625
D_1		mm	75	95	120	120	120	120	150	150	150
D_2		mm	-	-	-	130	200	207	257	312	387
C		mm	55	65	85	102	102	102	135	135	135
C_1		mm	62,5	72,5	92,5	117	117	117	150	150	150
d máx.	keyed	mm	0-40	0-55	0-75	0-75	0-75	0-75	0-100	0-100	0-100
	shrink fit	mm	40	65	80	80	80	80	100	100	100

DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C **Revision date: 23.08.2022**

Thickness 30 mm: Ø315 to 995 mm for solid discs **P30**
Ø315 to 795 mm for ventilated discs **V30**

Thickness 42 mm: Ø625 - 795 - 995 mm for ventilated discs **V42**

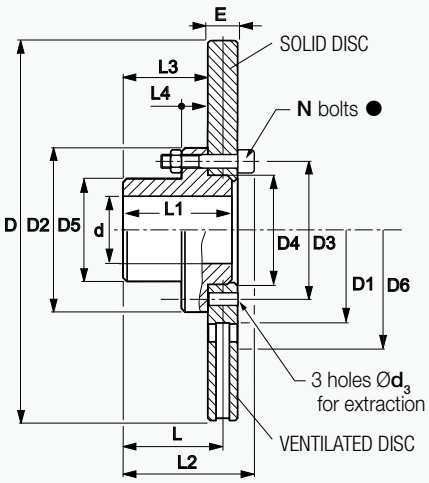
Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01
Note: hubs are not balanced.

DISCS WITH HUB

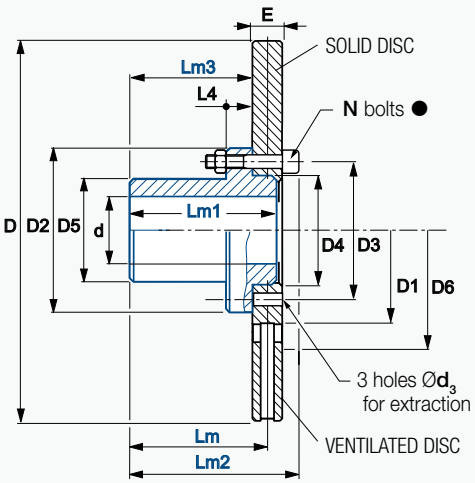
●
Screws not tightened to the torque at the delivery

N: Number of bolts
nut H / screw CHc Ø**d1**
class 10-9, with MoS2 lubrication under head and on thread
Tightening torque β
Clamping tool dispersion = ±10%

STANDARD HUB

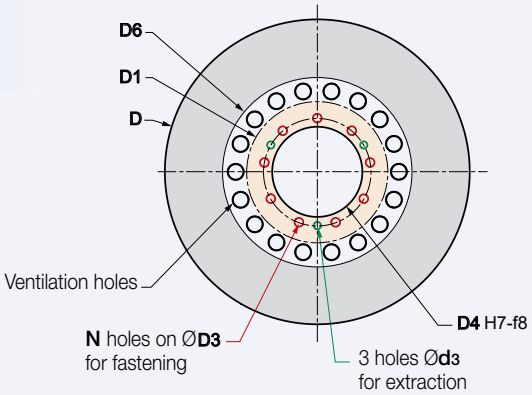


LONG HUB

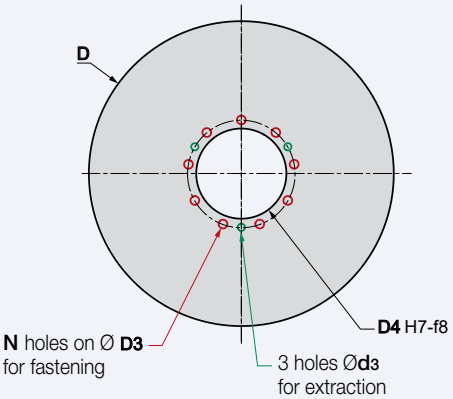


DRILLED BARE DISCS (drilled, bored) WITHOUT HUB

VENTILATED DISC

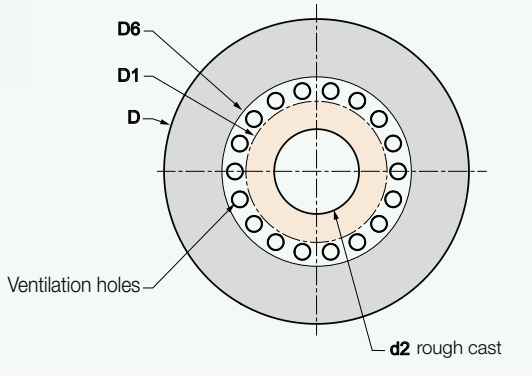


SOLID DISC

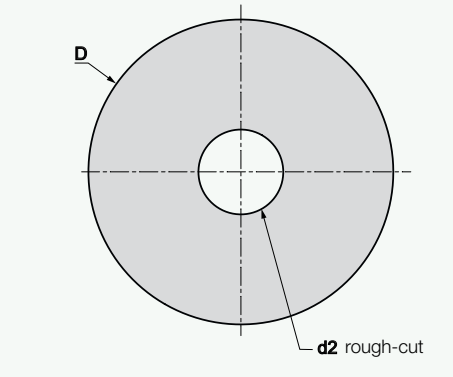


BARE DISCS (not drilled, not bored) WITHOUT HUB

VENTILATED DISC



SOLID DISC



DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C **Revision date: 23.08.2022**

Thickness 30 mm: Ø315 to 995 mm for solid discs **P30**
Ø315 to 795 mm for ventilated discs **V30**

Thickness 42 mm: Ø625 - 795 - 995 mm for ventilated discs **V42**

Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01
Note: hubs are not balanced.

Diameters 315 to 550 mm

Designation	Ø Disc		315		355		395		445		495		550	
	P=solid V=Ventilated 30 = E		P30	V30	P30	V30	P30	V30	P30	V30	P30	V30	P30	V30
Inertia J	Drilled bare disc	kg.m²	0.225	0.139	0.362	0.226	0.56	0.324	0.896	0.537	1.367	0.843	2.09	1.15
	Disc/Standard hub		0.234	0.148	0.379	0.243	0.588	0.352	0.94	0.581	1.492	0.968	2.22	1.28
	Disc/Long hub		0.245	0.159	0.382	0.246	0.593	0.357	0.946	0.587	1.515	0.991	2.243	1.303
Weight	Drilled bare disc	kg	17	10	21	12	27	16	34	19	41	23	52	29
	Disc/Standard hub		21.7	14.7	27.5	18.5	34	23	46.5	31.5	65	47	76	53
	Disc/Long hub		22.5	15.5	30.5	21.5	37.6	26.6	51	36	73	55	84	61
Maximum speed		rpm	3000		2700		2400		2100		1900		1800	
Max. braking torque ■		N.m	1720		2987		4594		8798		14321		14321	
L	Disc/Standard hub	mm	102		102		102		135		135		135	
L1		mm	107		107		107		140		140		140	
L2		mm	127		129		131		166		168		168	
L3		mm	87		87		87		120		120		120	
L4		mm	28		28		28		30		38		38	
Lm	Disc/Long hub	mm	135		155		155		195		195		195	
Lm1		mm	140		160		160		200		200		200	
Lm2		mm	160		182		182		226		228		228	
Lm3		mm	120		140		140		180		180		180	
D		mm	315		355		395		445		495		550	
D1		mm	-	139	-	172	-	177	-	184	-	230	-	275
D2		mm	125		145		165		175		220		220	
D3		mm	105		125		140		146		190		190	
D4		mm	85		105		115		120		160		160	
D5		mm	80		95		105		110		150		150	
D6		mm	-	165	-	206	-	246	-	216	-	256	-	325
d3		mm	M10		M12		M14		M16		M18		M18	
d2		mm	76.5		96.5		106.5		111.5		151.5		151.5	
d max **	keyed shrink fit	mm	50		60		70		75		100		100	
d1	Assembling bolts	mm	M10		M12		M14		M16		M18		M18	
N			9		9		9		12		12		12	
β		N.m	48		84		133		204		285		285	

■ Maximum braking torque allowed by the bolts of disc and hub assembling.

STOP **ATTENTION !**
The torque transmissible by shaft and keying must be checked.

** Tolerance on **d** and keying on Customer demand.

DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C **Revision date: 23.08.2022**

Thickness 30 mm: Ø315 to 995 mm for solid discs **P30**
Ø315 to 795 mm for ventilated discs **V30**

Thickness 42 mm: Ø625 - 795 - 995 mm for ventilated discs **V42**

Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01
Note: hubs are not balanced.

Diameters 625 to 995 mm

Designation		Ø Disc	625		705		625-2		705-2		795		995	625	795	995
		P=solid V=Ventilated 30 = E	P30	V30	P30	V30	P30	V30	P30	V30	P30	V30	P30	V42		
Inertia J	Drilled bare disc	kg.m²	3.506	2.06	5.69	3.46	3.45	2.004	5.62	3.39	9.23	5.65	22.51	2,5	6,5	20
	Disc/Standard hub		3.676	2.23	5.99	3.76	3.94	2.494	6.11	3.88	9.72	6.14	23.86	2.92	7.85	21.3
	Disc/Long hub		3.699	2.253	6.038	3.808	4.02	2.574	6.13	3.9	9.802	6.222	23.9	-	-	-
Weight	Drilled bare disc	kg	68	41	86	53	63	36	82.5	49.5	110	70	170	45	77	177
	Disc/Standard hub		87.5	60.5	105	72	128.5	101.5	148	115	175.5	135.5	243	90	150	250
	Disc/Long hub		96	69	117	84	144	117	163.5	130.5	191	151	271	-	-	-
Maximum speed		rpm	1500		1300		1500		1300		1200		900	1500	1200	900
Max. braking torque ■		N.m	19915		27905		36 384						73897	36 384	73 897	73 897
L	Disc/Standard hub	mm	135		135		135						135	141	141	141
L1		mm	140		140		140						140	140	140	140
L2		mm	170		172		174						174	186	186	186
L3		mm	120		120		120						120	120	120	120
L4		mm	38		40		40						40	40	40	40
Lm	Disc/Long hub	mm	195		195		195						135	-	-	-
Lm1		mm	200		200		200						140	-	-	-
Lm2		mm	230		232		234						174	-	-	-
Lm3		mm	180		180		180						120	-	-	-
D		mm	625		705		625		705		795		995	625	795	995
D1		mm	343		418		343		418		498		-	302	486	694
D2		mm	235		265		300						380	300	380	380
D3		mm	205		230		260						330	260	330	330
D4		mm	170		195		220						280	220	280	280
D5		mm	150		180		210						260	210	260	260
D6		mm	-	387	-	462	-	387	-	462	-	542	-	370	542	745
d3		mm	M20		M22		M24						M30	M24	M30	M30
d2		mm	161.5		185.5		161.5		185.5		211.5		211.5	211	211	211
d max **	keyed shrink fit	mm	100		125		140						180	40-140	40-180	40-180
d1	Assembling bolts	mm	M20		M22		M24						M30	M24	M30	M30
N			12		12		12						12	12	12	12
β		N.m	398		541		685						1364	685	1364	1364

■ Maximum braking torque allowed by the bolts of disc and hub assembling.

STOP **ATTENTION !**
The torque transmissible by shaft and keying must be checked.

** Tolerance on **d** and keying on Customer demand.

DISCS - VENTILATED AND SOLID DISCS

Revision number: T02220-01-C **Revision date: 23.08.2022**

Part numbers of the drilled bare discs (drilled and bored) without hub

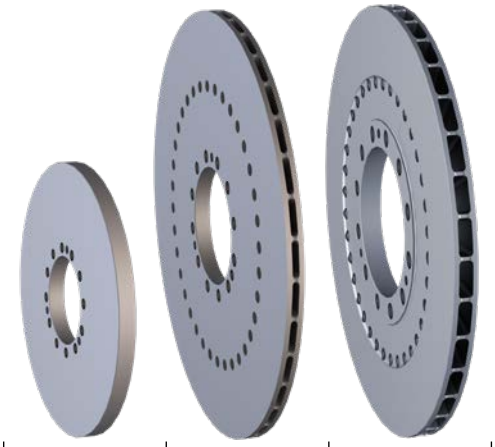
Drilled bare disc (without hub)	Part number
315 P30	944-62830
355 P30	945-44080
395 P30	944-63090
445 P30	944-62820
495 P30	944-62810
550 P30	944-62800
625 P30-1	944-62770
625 P30-2	945-60380
705 P30-1	944-62780
705 P30-2	945-60400
795 P30	944-62790
995 P30	944-63030

Drilled bare disc (without hub)	Part number
315 V30	944-56110
355 V30	944-56450
395 V30	944-56030
445 V30	944-56150
495 V30	944-31330
550 V30	944-56070
625 V30-1	944-56190
625 V30-2	945-60370
705 V30-1	944-56230
705 V30-2	945-60390
795 V30	944-56270

Drilled bare disc (without hub)	Part number
625 V42	944-39640
795 V42	944-38950
995 V42	944-38940

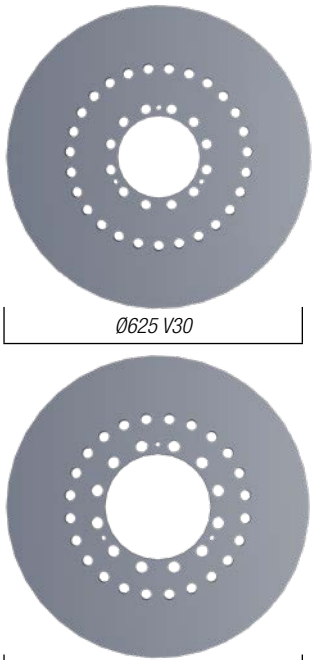
Material of discs and hubs, protection of discs and balancing, see leaflet Nr. T08020-01
Note: hubs are not balanced.

Examples of drilled bare discs and discs with hub



Ø495 P30 | *Ø795 V30* | *Ø795 V42*

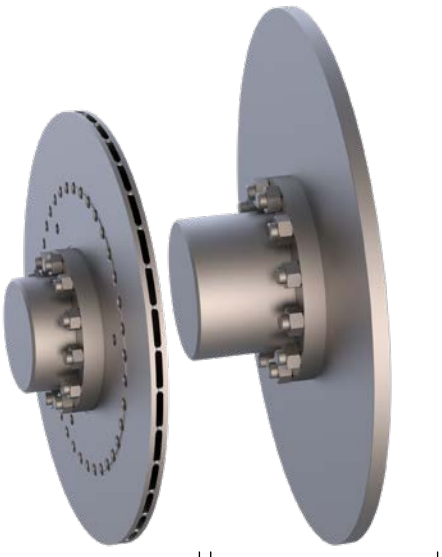
Bare drilled discs (bored)



Ø625 V30

Ø625 V30-2

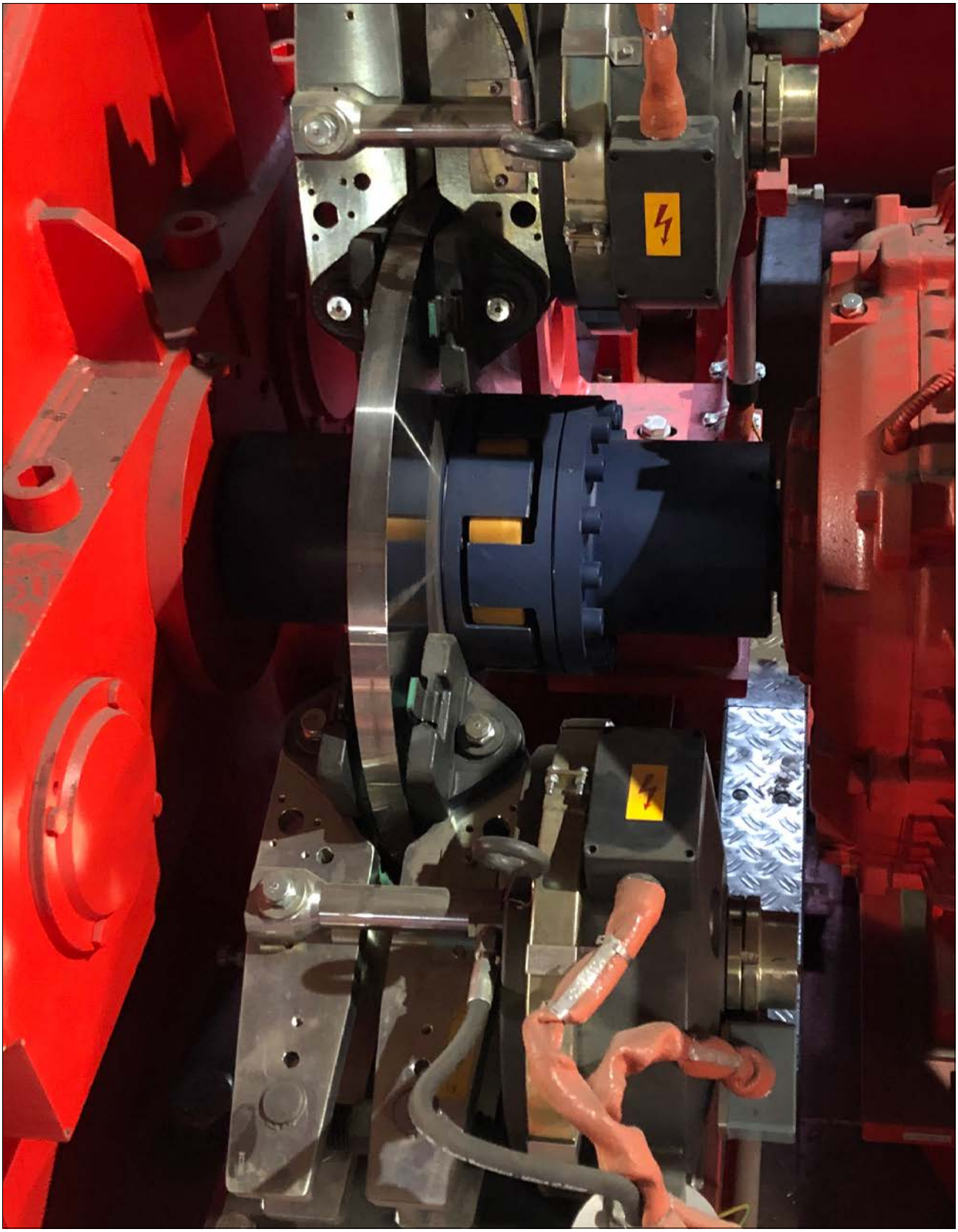
Bare drilled discs (bored)



Ø795 V30 | *Ø995 P30*

Disc/Standard hub *Disc/Long hub*

COUPLINGS

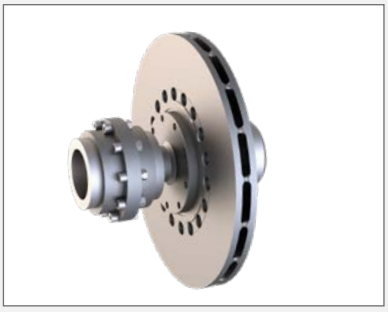


MAIN CHARACTERISTICS	OPTIONS
• IN ASSOCIATION WITH OUR MONOBLOC, SOLID AND VENTILATED DISCS • 3 TYPES OF DISC COUPLINGS FOR A COMPLETE BRAKING SYSTEM SOLUTION	• LONG HUB ON MOTOR SIDE: SDKL .. SVKL .. SMLDF • LONG HUB ON GEAR BOX SIDE: SDF-ML • LONG HUBS ON MOTOR AND GEAR BOX SIDES: SDKL/SVKL-ML .. SMLDF-ML

DISC COUPLINGS

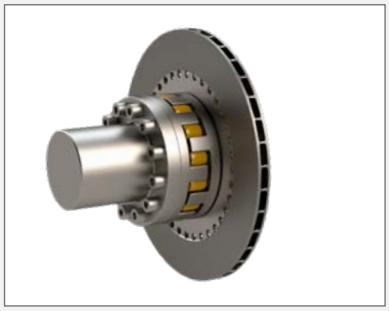
PERIFLEX®
TIRE FLEXIBLE COUPLINGS

- Highly-flexible rubber-fabric disc couplings
- Compensate extremely large offsets in every direction
- Allow radial mounting and dismantling without moving the machines
- Make torque transmission free from backlash
- Absorb torque peaks and damp occuring vibrations



SDF
GEAR COUPLINGS

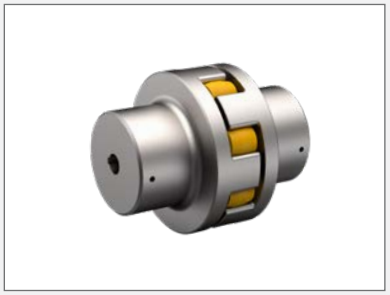
- All steel disc couplings
- Two flanged sleeves with internal spur gear teeth
- Disc mounting and dismounting without moving the machines back
- Closely controlled quality of the gearing profile for minimum end float and best alignment



E - SVKL
ELASTIC COUPLINGS

- Flexible disc coupling
- **SVKL / SDKL**:
  - Fitted with a rubber element (shore A or shore D).
  - Easy dismantling of the complete coupling and cam Ring
  - Damping of torsional vibrations
  - Noise reduction and shock load accomodation
- Available at: download.stromagfrance.com
  - **SVK/SDK:** standard hub
  - **SVKL-ML / SDKL-ML**: long hubs

COUPLINGS



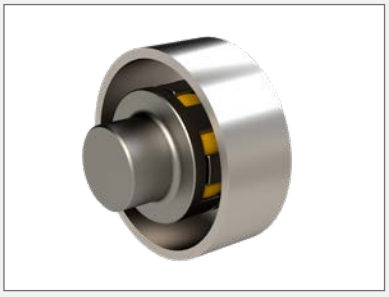
SVW - SDW
ELASTIC COUPLINGS

- Same characteristics as **SVKL / SDKL** wthout removable cam rings

SVR - SDR
ELASTIC COUPLINGS

- Same characteristics as **SVKL / SDKL**

DRUM COUPLINGS



SVT - PB-C
ELASTIC COUPLINGS

- **SVT**: Flexible drum coupling
- **PB-C**: flanged hub with rubber bushes

DISC COUPLINGS - PNF-PNQ-PND

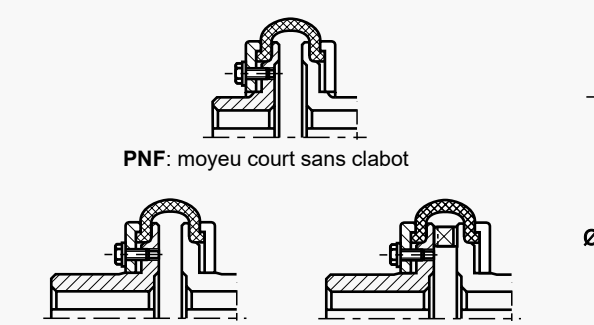
Revision number: T02805-01-F **Revision date: 15.07.2021**

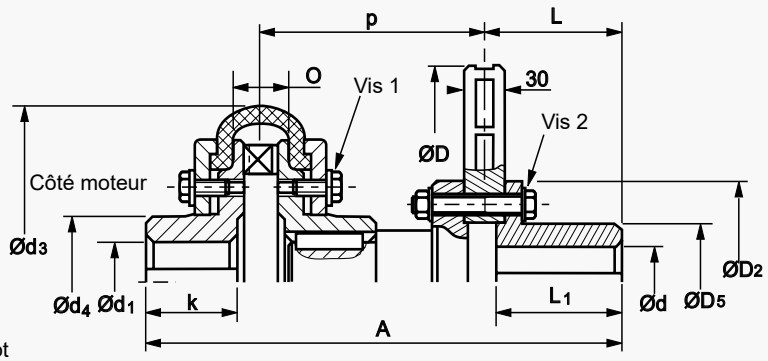
Flexible coupling **PNF. PNQ** and **PND** series
Discs thickness: 30mm
Rubber element and disc can be both removed without moving motor or gearbox back.

Use:
PNF and PNQ for horizontal motions only.
PND with lugs. compulsory for hoisting.

Option:
Solid Disc

Screws 1 and 2 not tightened to the torque at the delivery





Disc			315V30		355V30			395V30			445V30					495V30					
	Coupling PNF, PNQ and PND		25	50	25	50	100	50	100	200	100-1	100-2	200-1	200-2	200-3	100-1	100-2	200-1	200-2	300-1	300-2
Assembly	Nominal torque TN	N.m	300	600	300	600	1200	600	1200	2500	1200	1200	2500	2500	2500	1200	1200	2500	2500	4000	4000
	Max. Torque Tmax	N.m	900	1800	900	1 800	3600	1800	3600	7500	3600	3600	7500	7500	7500	3600	3600	7500	7500	12000	12000
	Association pinces		650 5K	645 5K	650	5K 650	645	645-5K			645 5K	4CA2	645 5K	4CA2	4CA2	645 5K	4CA2	645 5K	4CA2	645 5K	4CA2
	Maximum speed	tr/mn	3000	2500	2700	2500	2500	2400	2400	2000	2100	2100	2000	2000	2000	1900	1900	1900	1900	1900	1900
	J:																				
	PNF	kgm²	0,18	0,24	0,283	0,333	0,456	0,37	0,589	1,08	0,776	0,656	1,475	1,545		1,266	1,272	1,655	1,68	1,6	1,62
	PNQ	kgm2	0,182	0,252	0,286	0,344	0,483	0,382	0,616	1,116	0,803	0,683	1,516	1,586		1,293	1,299	1,696	1,721	1,64	1,65
	PND	kgm2	0,187	0,267	0,291	0,36	0,512	0,397	0,645	1,14	0,832	0,71	1,541	1,61	1,61	1,322	1,328	1,721	1,746	1,66	1,67
	Poids:																				
	PNF	kg	29,3	35,5	34,8	43	57	45,5	63	93	74	71	94	96		95	98,5	118	128	128,5	131
	PNQ	kg	31,3	38,5	36,8	46	67	48,5	73	103	84	81	104	106		105	108,5	128	138,5	140	142,5
	PND	kg	32,4	40,7	37,9	48,2	68,7	50,7	74,7	107,5	85,7	82,7	108,5	110,5	110,5	106,7	110	132,5	142,5	141,5	144
	A																				
	PNF	mm	315	350	315	340	380	340	380	402	413	515	435	568		400	443	435	525	562	582
	PNQ, PND	mm	366	393	366	383	445	383	445	467	478	580	500	633	669	465	508	500	590	622	642
Disc	D	mm	315		355			395			445				445	495					
	D2	mm	125		145			165			175				175	220					
	D5	mm	80		95			105			110				110	150					
	L	mm	102		102			102			135				135	135					
	L1	mm	107		107			107			140				140	140					
	d max. keyed	mm	50		60			70			70				70	100					
	d max. for shrink fit	mm	50		60			70			70				70	100					
Coupling	d3	mm	210	263	210	263	310	263	310	370	310	310	370	370	370	310	310	370	370	402	402
	d4	mm	80	95	80	95	125	95	125	150	125	125	150	150	150	125	125	150	150	160	160
	k PNF	mm	59	67	59	67	75	67	75	85	75	75	85	85		75	75	85	85	95	95
	k PNQ, PND	mm	110	110	110	110	140	110	140	150	140	140	150	150	150	140	140	150	150	155	155
	O	mm	38	44	38	44	42	44	42	48	42	42	46	46	46	42	42	46	46	50	50
	p	mm	138	161	138	151	178	151	178	192,5	178	280	192,5	325,5	361,5	165	208	192,5	282,5	305	325
	d1 max. keyed PNF	mm	55	65	55	65	90	65	90	100	90	90	100	100		90	90	100	100	110	110
	d1 max. keyed PNQ	mm	55	65	55	65	90	65	90	100	90	90	100	100		90	90	100	100	110	110
	d1 max. keyed PND	mm	55	65	55	65	85	65	85	100	85	85	100	100	100	85	85	100	100	110	110
	d1 max. for shrink fit	mm	50	60	50	60	80	60	80	90	80	80	90	90	90	80	80	90	90	100	100
Tightening torque screw 1		N.m	20	25	20	25	45	25	45	55	45	45	55	55	55	45	45	55	55	60	60
Tightening torque screw 2		N.m	49	49	86	86	86	135	135	135	210	210	210	210	210	290	290	290	290	290	290

Maximum permissible torque Tt and working conditions (ambient temperature ≤ 40°C)	>300 start/h: Tt=TN/2,5 ≤300 start/h AT 120 start/h: Tt=TN/2 ≤120 start/h: Tt=TN/1,5	**NOTE:** For shrink fit, k and A are modified (consult us) At the delivery, screws 1 and 2 are not tightened to the torque In each case: engine start coupling Td<Tmax

DISC COUPLINGS - PNF-PNQ-PND

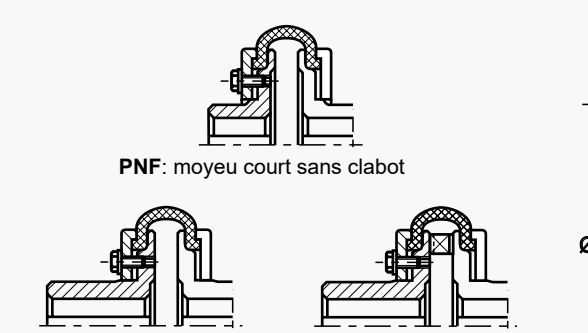
Revision number: T02805-01-F **Revision date: 15.07.2021**

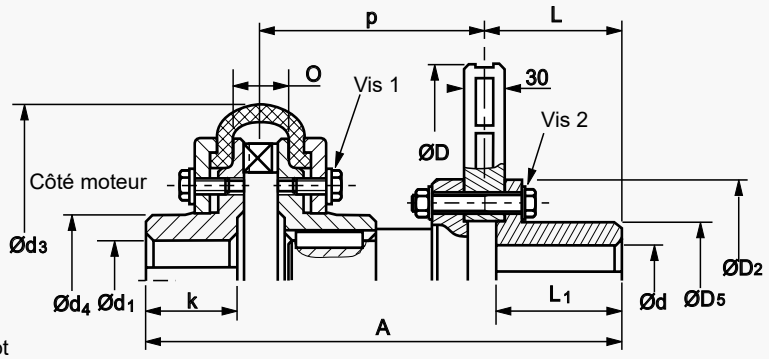
Flexible coupling **PNF. PNQ** and **PND** series
Discs thickness: 30mm
Rubber element and disc can be both removed without moving motor or gearbox back.

Use:
PNF and PNQ for horizontal motions only.
PND with lugs. compulsory for hoisting.

Option:
Solid Disc

Screws 1 and 2 not tightened to the torque at the delivery





Disc			550V30						625V30			705V30		795V30		
	Coupling PNF, PNQ and PND		100	200-1	200-2	300-1	300-2	300-3	200	300	400	400	800	400	800	1500
Assembly	Nominal torque TN	N.m	1200	2500	2500	4000	4000	4000	2500	4000	6000	6000	10000	6000	10000	15000
	Max. Torque Tmax	N.m	3600	7500	7500	12000	12000	12000	7500	12000	18000	18000	30000	18000	30000	45000
	Association pinces		645 5K	645 5K	4CA2	645 5K	4CA2	3CA2	4CA2	3CA2		3CA2		3CA2		
	Maximum speed	tr/mn	1800	1800	1800	1800	1800	1800	1500	1500	1500	1300	1250	1200	1200	900
	J:															
	PNF	kgm²	1,68	2,03	2,04	1,95	1,97	1,99	2,49	3,34	4,15	5,43	7,39	7,85	9,82	17,92
	PNQ	kgm2	1,7	2,07	2,08	1,98	2	2,03	2,53	3,38	4,25	5,52	7,54	7,95	9,96	18,17
	PND	kgm2	1,73	2,1	2,11	2	2,03	2,06	2,56	3,4	4,33	5,61	7,81	8,05	10,24	18,42
	Poids:															
	PNF	kg	101	124	126	123	131,5	134,5	137	151	182	191	258	207	283	587
	PNQ	kg	111	134,5	136,5	134	142,5	145,5	147,5	162,5	202	211	281	227	305,5	623,5
	PND	kg	112,7	138,5	140,5	136	144,5	148,5	151,5	164	206	215	297,5	231	322,5	641,5
	A															
	PNF	mm	400	435	450	470	535	580	450	470	575	495	635	495	635	810
	PNQ, PND	mm	465	500	515	530	595	640	515	530	655	575	715	575	715	905
Disc	D	mm	550						625			705		795		
	D2	mm	220						235			265		300		
	D5	mm	150						150			180		210		
	L	mm	135						135			135		135		
	L1	mm	140						140			140		140		
	d max. keyed	mm	100						100			120		130		
	d max. for shrink fit	mm	100						100			120		130		
Coupling	d3	mm	310	370	370	402	402	402	370	402	450	450	550	450	550	700
	d4	mm	125	150	150	160	160	160	150	160	180	180	210	180	210	270
	k PNF	mm	75	85	85	95	95	95	85	95	110	110	130	110	130	160
	k PNQ, PND	mm	140	150	150	155	155	155	150	155	190	190	210	190	210	255
	O	mm	42	46	46	50	50	50	46	50	70	70	120	70	120	150
	p	mm	165	192,5	207,5	213	278	323	207,5	213	300	220	320	220	320	400
	d1 max. keyed PNF	mm	90	100	100	110	110	110	100	110	110	110	130	110	130	180
	d1 max. keyed PNQ	mm	90	100	100	110	110	110	100	110	120	120	120	120	140	180
	d1 max. keyed PND	mm	90	100	100	110	110	110	100	110	120	120	120	120	140	180
	d1 max. for shrink fit	mm	80	90	90	100	100	100	80	100	105	105	120	105	120	170
Tightening torque screw 1		N.m	45	55	55	60	60	60	55	60	110	110	200	110	200	240
Tightening torque screw 2		N.m	290	290	290	290	290	290	410	410	410	550	550	710	710	710

Maximum permissible torque Tt and working conditions (ambient temperature ≤ 40°C)	>300 start/h: Tt=TN/2,5 ≤300 start/h AT 120 start/h: Tt=TN/2 ≤120 start/h: Tt=TN/1,5	**NOTE:** For shrink fit, k and A are modified (consult us) At the delivery, screws 1 and 2 are not tightened to the torque In each case: engine start coupling Td<Tmax

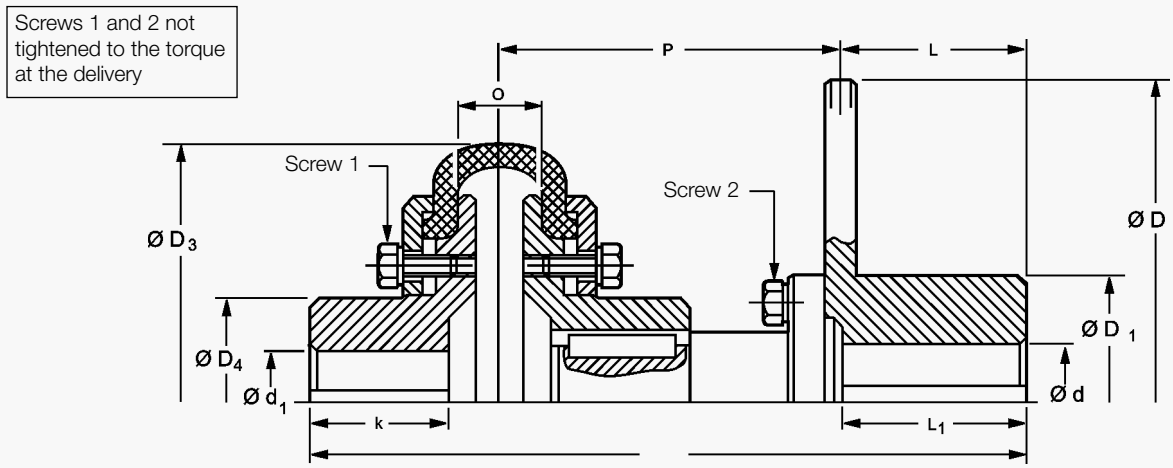
Couplings

DISC COUPLINGS - PNK

Revision number: T02561-01-B **Revision date: 25.11.2010**

Flexible coupling **PNK** series
Solid disc thickness 15 mm
Rubber element and disc can both be removed without disturbing motor or gearbox
Without lug.

Use:
For horizontal motions
For hoist motions, please consult us.



Designation			DISC	175P15			220P15			260P15		315P15		395P15		445P15		495P15	550P15	625P15	
			Coupling PNK	2	6	16	2	6	16	6	16	16	40	40	63	40	63	63	125	125	160
ASSEMBLY	Coupling																				
	Nominal torque Cn	Nm		50	100	200	50	100	200	100	200	200	400	400	800	400	800	800	1600	1600	2000
	Max. torque Cmáx.	Nm		150	300	600	150	300	600	300	600	600	1200	1200	2400	1200	2400	2400	4800	4800	6000
	Combined caliper			660		650	660		650	660	650	650	645	650	645	650	645	645	645	645	
	Maximum speed	rpm		5000	5000	4000	4300	4300	4000	3600	3600	3000	3000	2400	2400	2100	2100	1900	1800	1500	1500
	J			0,011	0,013	0,023	0,030	0,042	0,045	0,066	0,076	0,146	0,168	0,338	0,408	0,520	0,595	0,89	1,42	2,19	2,58
	Weight	kg		6	7,4	11	9,4	11,6	15,3	18	21,4	26	31,5	38,5	46	42	51	69	89	100	120
	ℓ	mm		185	215	250	195	225	250	245	265	295	340	340	370	340	270	410	460	460	435
DISC	D	mm		175			220			260		315		395		445		495	550	625	
	D_1	mm		75			95			120		120		120		120		150	150	150	
	L	mm		55			65			85		102		102		102		135	135	135	
	L_1	mm		58,5			68,5			88,5		112		112		112		145	145	145	
	Bore d keyed	mm		40			55			75		75		75		75		100	100	100	
	max. d shrink fit ✱	mm		35			50			65		65		65		65		90	90	90	
COUPLING	D_3	mm		104	136	178	104	136	178	136	178	178	210	210	263	210	263	263	310	310	370
	D_4	mm		40	55	70	40	55	70	55	70	70	92	92	107	92	107	107	140	140	150
	k	mm		30	45	50	30	45	50	45	50	50	65	65	75	65	75	75	100	100	85
	O	mm		16	18	35	16	18	35	18	35	35	38	38	44	38	44	44	42	42	46
	P	mm		95	105	130	95	105	120	105	115	128	158	158	173	158	173	180	205	205	192.5
	Bore d_1 keyed	mm		28	38	48	28	38	48	38	48	48	65	65	75	65	75	75	100	100	100
	max. d_1 shrink fit ✱	mm		28	38	42	28	38	42	38	42	42	60	60	70	60	70	70	90	90	90
Tightening torque in Nm		Screw 1	mm	4	6	15	4	6	15	6	15	15	20	20	25	20	25	25	45	45	55
		Screw 2	mm	25	25	25	25	25	25	25	25	49	69	86	120	86	120	210	210	210	295

Max. transmissible torque (Ct) and working conditions (ambient temperature ≤ 40°C)

> 300 starts/ hour: Ct = Cn / 2.5
≤ 300 starts/ hour to 120 starts/ hour: Ct = Cn / 2
≤ 120 starts/ hour: Ct = Cn / 1.5

✱ For shrink fit, dimensions k and ℓ are altered (consult us)
At delivery, screws 1 and 2 are not tightened to the torque.
In each case, motor starting torque Cd<Cmax

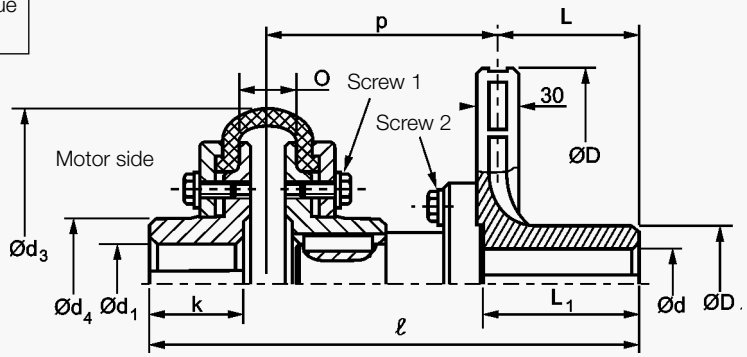
DISC COUPLINGS - PNM

Revision number: T02661-01-B **Revision date: 25.11.2010**

Coupling **PNM** series
Monobloc disc with thickness: 30mm
Rubber element and disc can both be removed without moving motor or gearbox back
Without lug

Use:
For horizontal motions.
For hoist motions, consult us.

Screws 1 and 2 not tightened to the torque at the delivery



Designation			Disc	220M30			260M30			315M30		
			Coupling PNM	2	6	16	6	16	40	16	40	63
Assembly	Nominal coupling torque Cn	Nm		50	100	200	100	200	400	200	400	800
	Maximum coupling torque Cmax	Nm		150	300	600	300	600	1200	600	1200	2400
	For use with calipers			650 - 5D			650 - 5D			650 - 5D - 5K		
	Maximum speed	tr/mn		4300	4300	4000	3600	3600	3600	3000	3000	3000
	J	kgm²		0.056	0.06	0.07	0.072	0.085	0.107	0.155	0.178	0.248
	Weight	kg		13	15.2	19	15	18.4	22.5	20	25.5	33.5
	ℓ	mm		244.5	277	309.5	275.5	295.5	332	295	340	358
Disc	D	mm		220			260			315		
	D_1	mm		85			85			90		
	L	mm		102			102			102		
	L_1	mm		112			112			112		
	d min.	mm		20			30			35		
	d max. keyed	mm		55			55			60		
Coupling	d_3	mm		104	136	178	136	178	210	178	210	263
	d_4	mm		40	55	70	55	70	92	70	92	107
	k	mm		30	45	50	45	50	65	45	65	75
	O	mm		16	18	35	18	35	38	35	38	44
	p	mm		107.5	120	142.5	118.5	128.5	150	128	158	161
	d_1 max. keyed	mm		28	38	48	38	48	65	48	65	75
	Tightening torque of screws 1	Nm		4	6	15	6	15	20	20	20	20
	Tightening torque of screws 2	Nm		25	25	25	25	25	69	49	69	69
Maximum permissible torque Ct and working conditions (ambient temperature ≤ 40°C)				>300 start/h: Ct=Cn/2.5 ≤300 start/h at 120 start/h: Ct=Cn/2 ≤120 start/h: Ct=Cn/1.5					In each case, motor starting torque Cd < Cmax Other versions, consult us.			

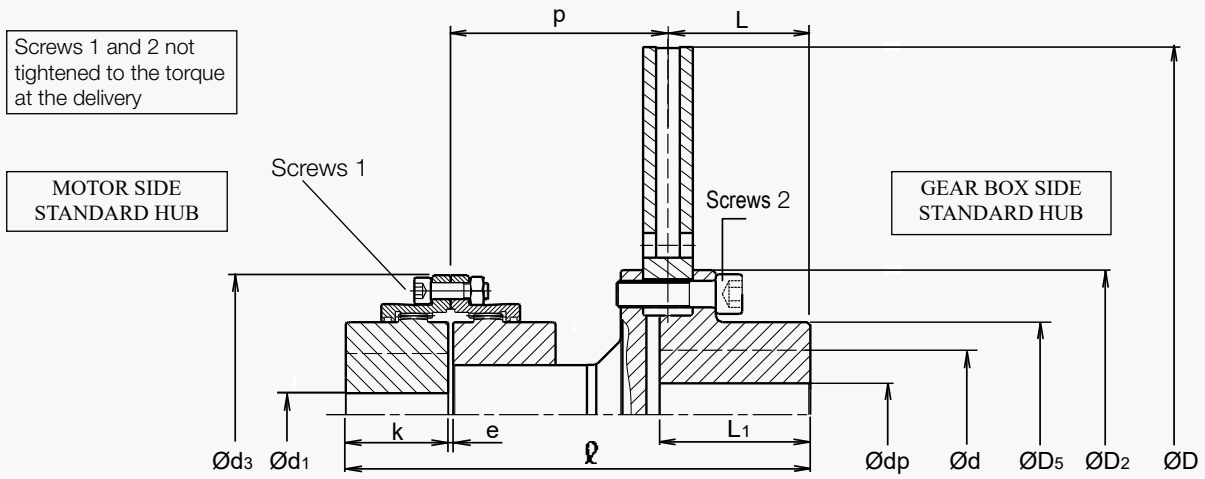
DISC COUPLINGS - SDF

Revision number: T10004-01-F **Revision date: 07.02.2022**

Gear coupling type **SDF**
Solid discs (**P**) and ventilated discs (**V**)
thickness 30mm
Disc mounting and dismounting without moving the machines back
Horizontal operation
(vertical operation: consult us)

Stromag provides also the couplings:
SDF-ML with long hub on gear box side
SMLDF with long hub on motor side
SMLDF-ML with long hub on each side, consult us.

Hub and coupling: oiling protection.
Material and balancing of the discs: see the discs "technical data" leaflet
In standard, only the disc is balanced. The assembly is balanced on demand (parts angularly matched).



Degrease faces in contact between disc, hub and coupling

Designation				Disc	315 P30/*V30*		355 P30/*V30*		395 P30/*V30*			
				SDF	68		68		68		80	
Assembly	J	P30	*V30*	kg.m²	0.246	0.16	0.391	0.255	0.604	0.368	0.622	0.386
	Weight	P30	*V30*	kg	32	25	39	30	47.5	36.5	53	42
	ℓ			mm	274		274		274		286	
	Maximum speed			rpm	3000		2700		2400			
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)							
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp							
Disc	D			mm	315		355		395			
	D2			mm	125		145		165			
	D5			mm	80		95		105			
	L			mm	102		102		102			
	L1			mm	107		107		107			
	dp			mm	--		--		--			
	d maximum keyed			mm	50		60		70			
	d max. shrink fit			mm	50		60		70			
	Tightening torque screw 2 ✱			N.m	49		86		135			
Coupling	d3			mm	140		140		140		169	
	e			mm	3		3		3		3	
	k			mm	50		50		50		62	
	p			mm	120.5		120.5		120.5		120.5	
	d1 maximum keyed			mm	68		68		68		80	
	d1 max. shrink fit			mm	63		63		63		75	
	Tightening torque screws 1 ✱			N.m	33		33		33		60	
	Maximum peak torque (Tp)			N.m	1500		2200		2200			
	Transmissible torque (Tt)			N.m	750		1100		1100			
					In every case: Ts < Tp (Ts: motor starting torque)							

✱: greased under head and on thread

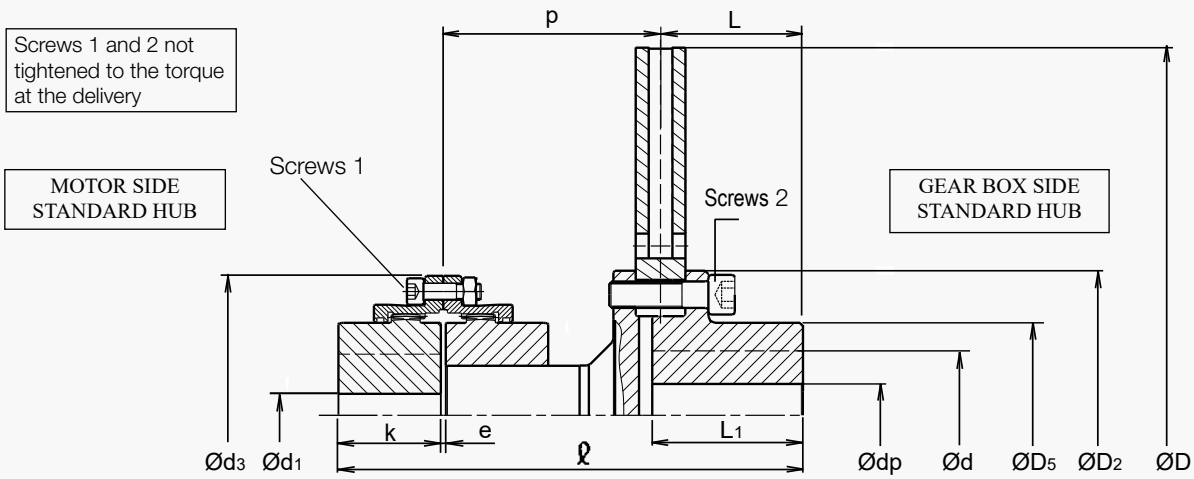
DISC COUPLINGS - SDF

Revision number: T10004-01-F **Revision date: 07.02.2022**

Gear coupling type **SDF**
Solid discs (**P**) and ventilated discs (**V**)
thickness 30mm
Disc mounting and dismounting without moving the machines back
Horizontal operation
(vertical operation: consult us)

Stromag provides also the couplings:
SDF-ML with long hub on gear box side
SMLDF with long hub on motor side
SMLDF-ML with long hub on each side, consult us.

Hub and coupling: oiling protection.
Material and balancing of the discs: see the discs "technical data" leaflet
In standard, only the disc is balanced. The assembly is balanced on demand (parts angularly matched).



Degrease faces in contact between disc, hub and coupling

Designation				Disc	445 P30/*V30*						495 P30/*V30*					
				SDF	68		80		100		80		100		115	
Assembly	J	P30	*V30*	kg.m²	0.945	0.586	0.964	0.605	1.012	0.653	1.524	1	1.574	1.05	1.664	1.14
	Weight	P30	*V30*	kg	58	43	64	49	74	59	86	68	97	79	112	94
	ℓ			mm	307		332		361		347		380		410	
	Maximum speed			rpm	2100						1900					
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)											
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp											
Disc	D			mm	445						495					
	D2			mm	175						220					
	D5			mm	110						150					
	L			mm	135						135					
	L1			mm	140						140					
	dp			mm	--						30					
	d maximum keyed			mm	75						100					
	d max. shrink fit			mm	75						100					
	Tightening torque screw 2 ✱			N.m	210						290					
Coupling	d3			mm	140		169		200		169		200		228	
	e			mm	3		3		5		3		5		5	
	k			mm	50		62		76		62		76		90	
	p			mm	120.5		133.5		147.5		148.5		166.5		182.5	
	d1 maximum keyed			mm	68		80		100		80		100		115	
	d1 max. shrink fit			mm	63		75		92		75		92		106	
	Tightening torque screws 1 ✱			N.m	33		60		60		60		60		95	
	Maximum peak torque (Tp)			N.m	2200		3800		6000		3800		6000		9400	
	Transmissible torque (Tt)			N.m	1100		1900		3000		1900		3000		4700	
					In every case: Ts < Tp (Ts: motor starting torque)											

✱: greased under head and on thread

Couplings

DISC COUPLINGS - SDF

Revision number: T10004-01-F **Revision date: 07.02.2022**

Gear coupling type **SDF**
Solid discs (**P**) and ventilated discs (**V**) thickness 30mm
Disc mounting and dismounting without moving the machines back
Horizontal operation
(vertical operation: consult us)

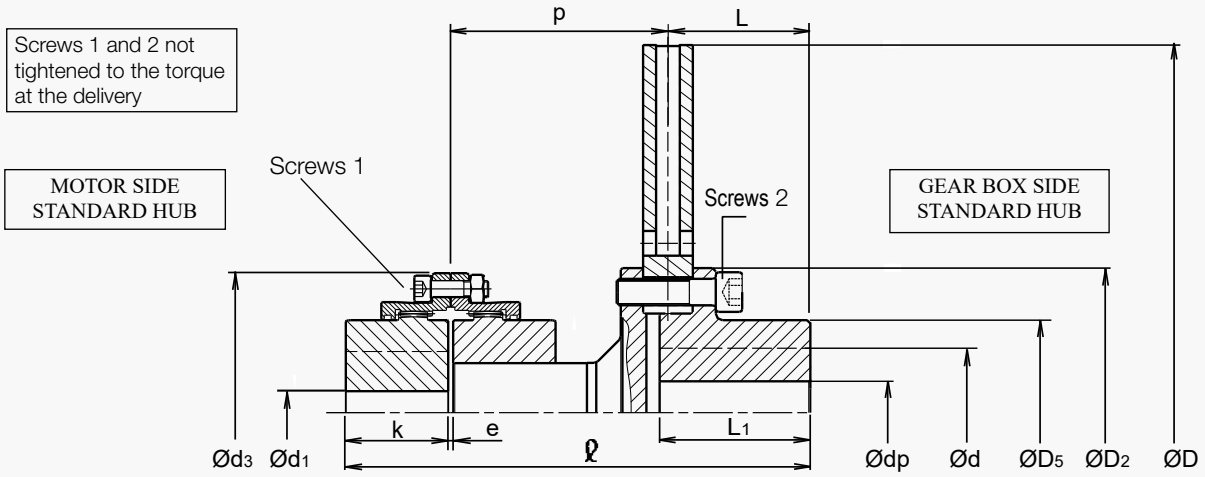
Stromag provides also the couplings:

SDF-ML with long hub on gear box side
SMLDF with long hub on motor side
SMLDF-ML with long hub on each side, consult us.

Hub and coupling: oiling protection.

Material and balancing of the discs: see the discs "technical data" leaflet

In standard, only the disc is balanced. The assembly is balanced on demand. (parts angularly matched).



Degrease faces in contact between disc, hub and coupling

Designation				Disc	550 P30/*V30*						625 P30/*V30*							
				SDF	80		100		115		100		115		135		150	
Assembly	J	P30	*V30*	kg.m²	2.247	1.307	2.297	1.357	2.387	1.447	3.775	2.329	3.863	2.417	4.065	2.619	4.352	2.906
	Weight	P30	*V30*	kg	97	74	108	85	123	100	131	104	145	118	167	140	195	168
	ℓ			mm	347		380		410		380		410		441		483	
	Maximum speed			rpm	1800						1500							
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)													
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp													
Disc	D			mm	550						625							
	D2			mm	220						235							
	D5			mm	150						150							
	L			mm	135						135							
	L1			mm	140						140							
	dp			mm	30						30							
	d maximum keyed			mm	100						100							
	d max. shrink fit			mm	100						100							
	Tightening torque screw 2 ✱			N.m	290						410							
Coupling	d3			mm	169		200		228		200		228		266		298	
	e			mm	3		5		5		5		5		6		6	
	k			mm	62		76		90		76		90		105		120	
	p			mm	148.5		166.5		182.5		166.5		182.5		198		225	
	d1 maximum keyed			mm	80		100		115		100		115		135		150	
	d1 max. shrink fit			mm	75		92		106		92		106		125		140	
	Tightening torque screws 1 ✱			N.m	60		60		95		60		95		171		235	
	Maximum peak torque (Tp)			N.m	3800		6000		9400		6000		9400		13800		20700	
	Transmissible torque (Tt)			N.m	1900		3000		4700		3000		4700		6900		10350	
					In every case: Ts < Tp (Ts: motor starting torque)													

✱: greased under head and on thread

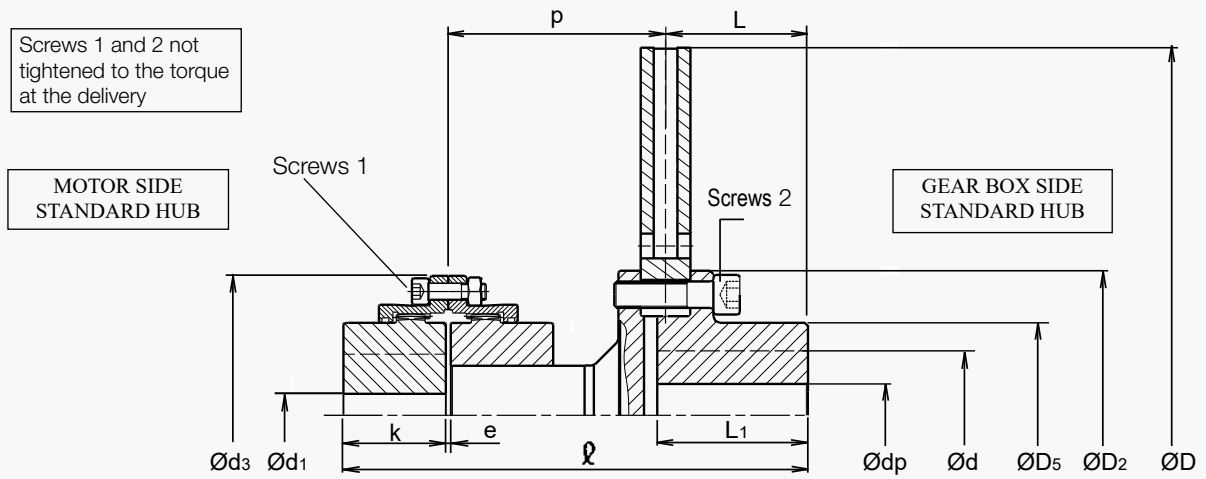
DISC COUPLINGS - SDF

Revision number: T10004-01-F **Revision date: 07.02.2022**

Gear coupling type **SDF**
Solid discs (**P**) and ventilated discs (**V**)
thickness 30mm
Disc mounting and dismounting without moving the machines back
Horizontal operation
(vertical operation: consult us)

Stromag provides also the couplings:
SDF-ML with long hub on gear box side
SMLDF with long hub on motor side
SMLDF-ML with long hub on each side, consult us.

Hub and coupling: oiling protection.
Material and balancing of the discs: see the discs "technical data" leaflet
In standard, only the disc is balanced. The assembly is balanced on demand. (parts angularly matched).



Degrease faces in contact between disc, hub and coupling

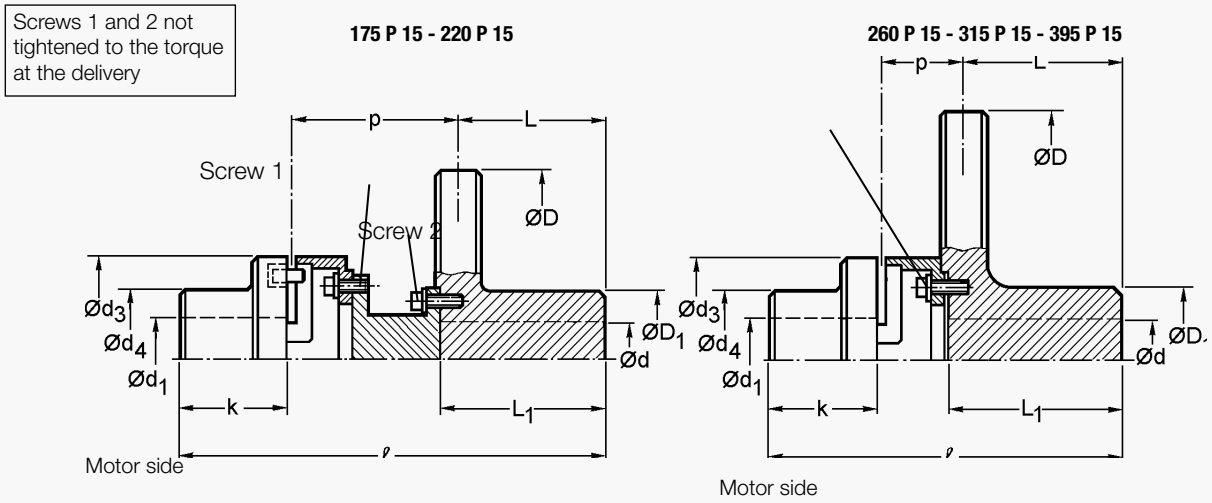
Designation				Disc	705 P30/*V30*								795 P30/*V30*					
				SDF	115		135		150		170		135		150		170	
Assembly	J	P30	*V30*	kg.m²	6.165	3.935	6.37	4.14	6.655	4.425	7.153	4.923	10.092	6.512	10.378	6.798	10.872	7.292
	Weight	P30	*V30*	kg	173	140	196	163	223	190	259	226	233	193	260	220	295	255
	ℓ			mm	410		441		483		513		441		483		513	
	Maximum speed			rpm	1300								1200					
	Maximum braking torque			N.m	Tb ≤ Tp (Tb = maximum braking torque. Tp = maximum peak torque)													
	For use with calipers				Check that D – D2 > width of the caliper braking surface (ex.: 4CA2 and 3CA2 not associated to discs D < 445) Check that the caliper nominal braking torque is ≤ Tp													
Disc	D			mm	705								795					
	D2			mm	265								300					
	D5			mm	180								210					
	L			mm	135								135					
	L1			mm	140								140					
	dp			mm	30								30					
	d maximum keyed			mm	125								140					
	d max. shrink fit			mm	125								140					
	Tightening torque screw 2 ✱			N.m	550								710					
Coupling	d3			mm	228		266		298		330		266		298		330	
	e			mm	5		6		6		8		6		6		8	
	k			mm	90		105		120		135		105		120		135	
	p			mm	182.5		198		225		239		198		225		239	
	d1 maximum keyed			mm	115		135		150		170		135		150		170	
	d1 max. shrink fit			mm	106		125		140		160		125		140		160	
	Tightening torque screws 1 ✱			N.m	95		171		235		235		171		235		235	
	Maximum peak torque (Tp)			N.m	9400		13800		25300		29200		13800		25300		36700	
	Transmissible torque (Tt)			N.m	4700		6900		12650		14600		6900		12650		18350	
					In every case: Ts < Tp (Ts: motor starting torque)													

✱: greased under head and on thread

DISC COUPLINGS - SERIES E

Revision number: T02580-01-B **Revision date: 25.11.2010**

Flexible coupling "NORMEX" E series
Solid discs Ø 175 to **395**
Disc thickness: 15 mm



Degrease faces in contact between disc and coupling.

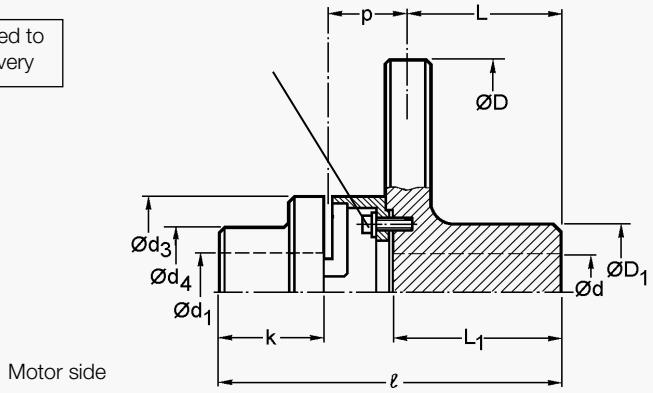
Designation		Disc	175 P 15		220 P 15		260 P 15		315 P 15			395 P 15		
		Coupling	97	112	112	128	112	128	112	128	148	128	148	168
Assembly	J	kgm²	0.017	0.019	0.038	0.042	0.065	0.070	0.13	0.135	0.14	0.31	0.315	0.335
	Weight	kg	8	9.5	12.5	15.5	18	21	22	24	28	30	34	39
	For use with caliper	type	660-650		660-650		660-650		660-650			660-650		
	Maximum speed	t/mn	5000		4300		3600		3000			2400		
	ℓ	mm	183	244	211	244	190	201	214.5	225.5	230	225.5	230	245
Disc	D	mm	175		220		260		315		315	395		
	D1	mm	75		95		120		120		120	120		
	L	mm	55		65		85		102		102	102		
	L1	mm	58.5		68.5		88.5		113		112	112		
	d max. keyed	mm	44		55		55		60		65	60	65	
	d max. for shrink fit	mm	40		55		55		60		65	60	65	
Coupling Pb75	d3	mm	97	112	112	128	112	128	112	128	148	128	148	168
	d4	mm	69	79	79	90	79	90	79	90	107	90	107	124
	k	mm	50	60	60	70	60	70	60	70	80	70	80	90
	p	mm	76.5	127.25	84.25	107.25	43.25	44.25	50.75	51.75	46.25	51.75	46.25	51.25
	d1 max. keyed	mm	42	48	48	55	48	55	48	55	65	55	65	75
	Peak max. torque(Cp)	Nm	200	310	310	500	310	500	310	500	800	500	800	1300
	Max. permissible torque (Ct) and working conditions (Ambient temperature ≤ 40 °C)		150 starts/ hour 8 h/24 h - Ct ≤ Cp/2.5 300 starts/ hour 8 h/24 h - Ct ≤ Cp/3.2 600 starts/ hour 8 h/24 h - Ct ≤ Cp/4						In every case: Cd < Cp (Cd motor starting torque) (Ct: motor nominal torque)					
	Tightening torque on screws (1) and (2) ✱	Nm	10	25	25	25	25	25	25	25	49	25	49	86

DISC COUPLINGS - SERIES E

Revision number: T02580-01-B **Revision date: 25.11.2010**

Flexible coupling "NORMEX" E series
Solid discs Ø 445 to 625
Disc thickness: 15 mm

Screws 1 not tightened to the torque at the delivery



Degrease faces in contact between disc and coupling.

Designation		Disc	445 P 15				495 P 15			550 P 15				625 P 15		
		Coupling	128	148	168	194	148	168	194	148	168	194	214	168	194	214
Assembly	J	kgm²	0.49	0.495	0.515	0.55	0.785	0.815	0.84	1.175	1.205	1.23	1.30	1.975	2	2.07
	Weight	kg	33	37	43	51	52	58	66	58	64	72	80	74	82	90
	For use with caliper	type	660-650-645				660-650-645			660-650-645				660-650-645		
	ℓ	mm	225.5	230	245	260	263	278	293	263	278	293	308	278	293	308
Disc	D	mm	445				495			550				625		
	D1	mm	120				150			150				150		
	L	mm	102				135			135				135		
	L1	mm	112				145			145				145		
	d max. keyed	mm	60	65			65	70		65	70	70	90	70	70	90
	d max. for shrink fit	mm	60	65			65	70		65	70	70	90	70	70	90
Coupling Pb75	d3	mm	128	148	168	194	148	168	194	148	168	194	214	168	194	214
	d4	mm	90	107	124	140	107	124	140	107	124	140	157	124	140	157
	k	mm	70	80	90	100	80	90	100	80	90	100	110	90	100	110
	p	mm	51.75	46.25	51.25	56.25	46.25	51.25	56.25	46.25	51.25	56.25	61	51.25	56.25	61
	d1 max. keyed	mm	55	65	75	85	65	75	85	65	75	85	95	75	85	95
	Peak max. torque (Cp)	Nm	500	800	1300	2000	800	1300	2000	800	1300	2000	3100	1300	2000	3100
	Max. permissible torque (Ct) and working conditions (Ambient temperature ≤ 40 °C)		150 starts / hour 8 h/24 h - Ct ≤ Cp/2.5 300 starts / hour 8 h/24 h - Ct ≤ Cp/3.2 600 starts / hour 8 h/24 h - Ct ≤ Cp/4							In every case: Cd < Cp (Cd motor starting torque) (Ct: motor nominal torque)						
	Tightening torque on screw (1) ✱	Nm	25	49	86	86	49	86	86	49	86	86	135	86	86	135

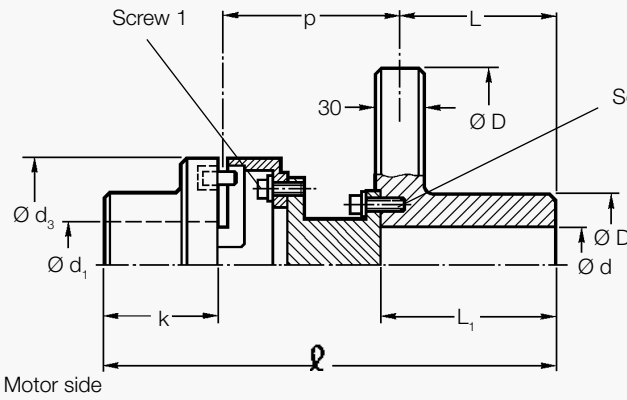
DISC COUPLINGS - SERIES E

Revision number: T02580-01-B **Revision date: 25.11.2010**

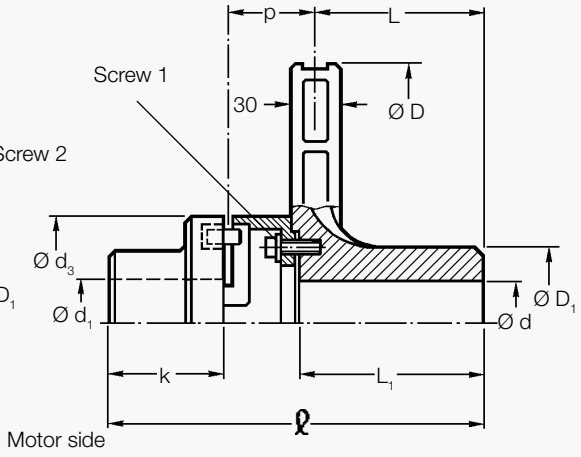
Flexible coupling E series
Monobloc discs Ø 220 - 260 - 315
Disc thickness: 30 mm

Screws 1 and 2 not tightened to the torque at the delivery

220 M30



260 M30 - 315 M30



Degrease faces in contact between disc and coupling.

Designation			Disc	220 M 30		260 M 30		315 M 30		
			Flexible coupling	112	128	112	128	112	128	148
Assembly	J	kgm²		0,063	0,067	0,078	0,09	0,145	0,155	0,16
	Weight	kg		16,2	19,2	15	18	17	20	24,5
	For use with calipers	Type		650-5D		650-5D		650-5D-5K		650-5D
	Maximum speed	r.p.m		4 300		3 600		3 000		
	ℓ	mm		313,5	323,5	220,5	231,5	231,5	225,5	230
Disque	D	mm		220		260		315		
	D1	mm		85		85		90		
	L	mm		102		102		102		
	L1	mm		113		120		113		
	d (pilot bore)	mm		20		30		35		
	d max. keyed	mm		55		55		60		
	d max. shrink fitted	mm		55		55		60		
Coupling Pb75	k	mm		60	70	60	70	60	70	80
	p	mm		149,75	149,75	56,75	57,75	50,75	51,75	46,25
	d3	mm		112	128	112	128	112	128	148
	d1 max. keyed	mm		48	55	48	55	48	55	65
	d1 max. shrink fitted	mm		-	-	-	-	-	-	-
	Peak maxi. torque (Cp)	Nm		310	500	310	500	310	500	800
	Transmissible torque (Ct) and working conditions (ambient temperature ≤ 40°C)			150 starts/hour 8 h/24 h - Ct ≤ Cp/2,5 300 starts/hour 8 h/24 h - Ct ≤ Cp/3,2 600 starts/hour 8 h/24 h - Ct ≤ Cp/4				In every case: Cd < Cp (Cd:motor starting torque) (Ct: motor nominal torque)		
	Tightening torque of screws 1 & 2 ✱	Nm		20	20	20	20	20	20	44

✱: stopped with normal glue

NOTES

DISC COUPLINGS - SVKL AND SDKL

Revision number: T10152-01-M **Revision date: 08.07.2022**

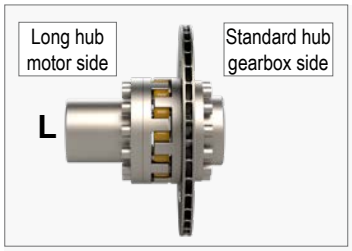
Elastic couplings series **SVKL** and **SDKL**
Long hub on motor side
Ventilated Discs thickness: **30 mm**
Disc mounting and dismounting without moving the machines back

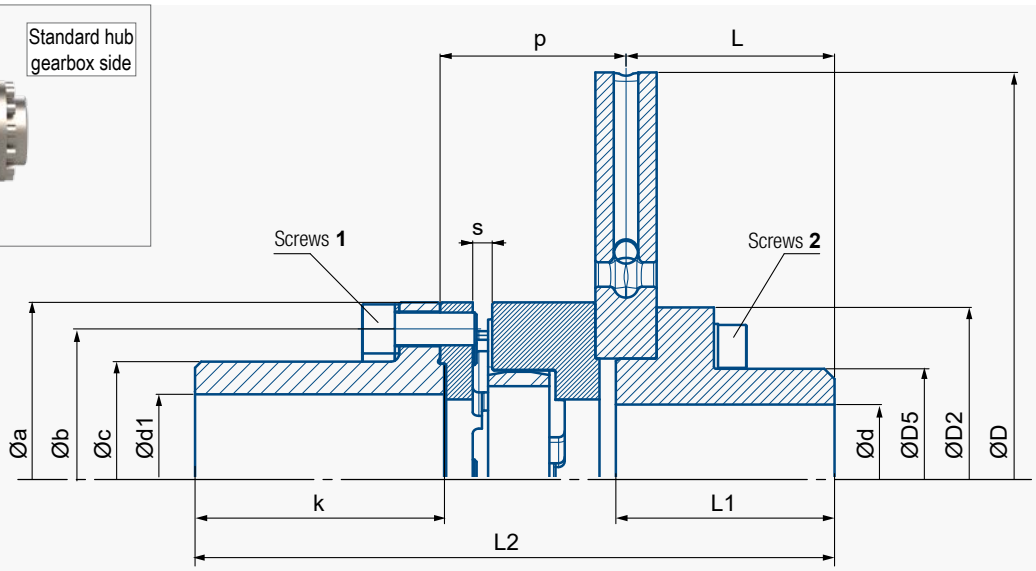
- SV**K**L: Rubber element **V**
- SV**D**L: Rubber element **D**

- Working temperature: -25°C to +80°C

Option:
- Solid Disc
- Painted coupling

Note: In standard, couplings are delivered oiled without protection





Degrease faces in contact between disc and coupling.

Elastic couplings SVKL / SDKL				125	145		170		200	230	
Disc diameter (th.30)				315	315	355	395	445	445	495	550
For use with calipers type				*650 . 5K*	*650 . 645 . 45K*		*650 . 645 . 5K . 45K*		*650 . 645 5K . 45K*	*650 . 645 . 5K . 45K*	
						5K		*4CA2 . 3CA2*		*4CA2*	*4CA2 . 3CA2*
ASSEMBLY	**J** with **ventilated disc**	kg.m²		0.17	0.18	0.27	0.42	0.68	0.73	1.2	1.74
	J with **solid disc**	kg.m²		0.26	0.27	0.41	0.66	1.04	1.09	1.69	2.68
	Max. weight bored	kg		27	31	37	48	57	64	96	107
	Maximum speed	r.p.m.		3000	3000	2700	2400	2100	2100	1800	1800
	L2			286.5	298	298	331.5	364.5	364.5	412.5	412.5
DISC	ØD	mm		315	315	355	395	445	445	495	550
	ØD2	mm		125	125	145	165	175	175	220	220
	ØD5	mm		80	80	95	105	110	110	150	150
	Ød max keyed or shrink fit	mm		50	50	60	70	70	70	100	100
COUPLING	L	mm		102	102	102	102	135	135	135	135
	L1	mm		107	107	107	107	140	140	140	140
	Øa	mm		125	145	145	170	170	200	230	230
	Øb	mm		105	125	125	144	144	165	190	190
	Øc	mm		80	100	100	112	112	130	150	150
	Ød1 max keyed	mm		55	70	70	80	80	95	110	110
	k	mm		110.5	110.5		140.5		130.5	169.5	
	p	mm		76	87.5		91		101	110	
	s	mm		6	6.5		7.5		8.5	9.5	
	Max. torque **Tk**max in Nm	Rubber element	V	750	1200	1200	1900	1900	2880	5150	5150
			D	1110	1800	1800	2850	2850	4950	7740	7740
Transmissible torque (**Tk**n) (**Tk**n: motor nominal torque)				**Tk**n ≤ **Tk**max/**k** **Ts**< **Tk**max	**k min.**	Temperature Rate	**k=3**	< 40°C ≤ 120 starts/h	**k=4**	< 80°C ≤ 240 starts/h	**k=6** ≤ 80°C ≤ 600 starts/h
Tightening torque ✱	Screws **1**	Nm		48	84	84	204	204	204	285	285
	Screws **2**	Nm		48	48	84	133	204	204	285	285

✱ Screws class 10.9 greased with molybdenum bisulphide grease under the head and in threads. Tightening tool dispersion = ±10%

Ts: motor starting torque. In all cases, **Ts < Tk**max

DISC COUPLINGS - SVKL AND SDKL

Revision number: T10152-01-M **Revision date: 08.07.2022**

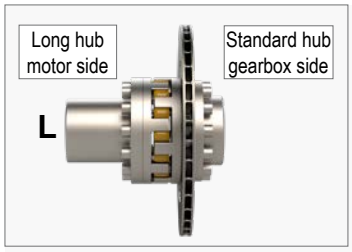
Elastic couplings series **SVKL** and **SDKL**
Long hub on motor side
Ventilated Discs thickness: **30 mm**
Disc mounting and dismounting without moving the machines back

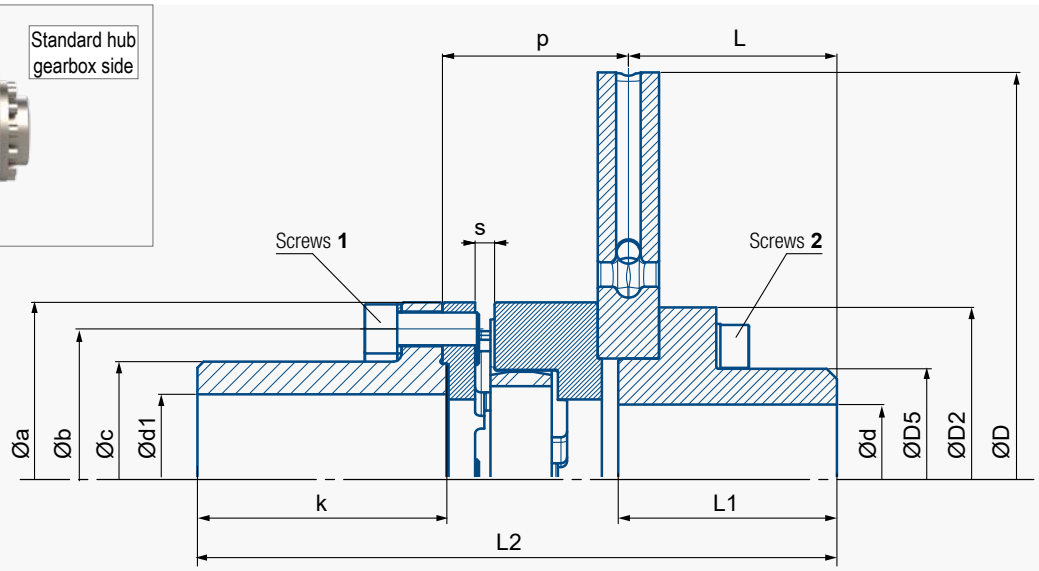
- SV**K**L: Rubber element **V**
- SV**D**L: Rubber element **D**

- Working temperature: -25°C to +80°C

Option:
- Solid Disc
- Painted coupling

NOTE: In standard, couplings are delivered oiled without protectio





Degrease faces in contact between disc and coupling.

Elastic couplings SVKL / SDKL			260			300				400	
Disc diameter (th.30)			550	625	705	625-2	705	705-2	795	705	795
For use with calipers type			*650 . 645 . 5K . 45K 4CA2 . 3CA2*		*4CA2 . 3CA2*	*650 . 645 . 45K 5K . 4CA2 . 3CA2*	*4CA2 . 3CA2*			*4CA2 . 3CA2*	
ASSEMBLY	**J** with **ventilated disc**	kg.m²	1.97	2.77	4.66	4.52	5.09	5.23	7.86	7.44	10.21
	J with **solid disc**	kg.m²	2.91	4.22	6.89	5.23	7.32	7.81	11.44	9.67	13.79
	Max. weight bored	kg	120	140	170	185	215	229.5	250	300	356
	Maximum speed	r.p.m.	1800	1500	1300	1500	1300	1300	1200	1300	1200
	L2		469	469	469	480	480	480	480	537	537
DISC	ØD	mm	550	625	705	625	705	705	795	705	795
	ØD2	mm	220	235	265	300	265	300	300	265	300
	ØD5	mm	150	150	180	210	180	210	210	180	210
	Ød max keyed or shrink fit	mm	100	100	120	130	120	130	130	120	130
COUPLING	L	mm	135	135	135	135	135	135	135	135	135
	L1	mm	140	140	140	140	140	140	140	140	140
	Øa	mm	260	260	260	300	300	300	300	400	400
	Øb	mm	220	220	220	260	260	260	260	335	335
	Øc	mm	175	175	175	210	210	210	210	250	250
	Ød1 max keyed	mm	125	125	125	140	140	140	140	160	160
	k	mm	209.5			209.5				250	
	p	mm	126.5			137.5				154	
	s	mm	9.5			10.5				10.5	
	Max. torque Rubber element	V	7950	7950	7950	11700	11700	11700	11700	26700	26700
	Tkmax in Nm	D	11940	11940	11940	17550	17550	17550	17550	30360	39700
Transmissible torque (**Tk**n) (**Tk**n: motor nominal torque)			**Tk**n ≤ **Tk**max/**k** **Ts< Tk**max	**k min.**	Temperature Rate	**k=3** < 40°C ≤ 120 starts/h		**k=4** < 80°C ≤ 240 starts/h	**k=6** ≤ 80°C ≤ 600 starts/h		
Tightening torque ✱	Screws **1**	Nm	541	541	541	685	685	685	685	1364	1364
	Screws **2**	Nm	285	398	541	541	541	685	685	541	685

✱ Screws class 10.9 greased with molybdenum bisulphide grease under the head and in threads. Tightening tool dispersion = ±10%

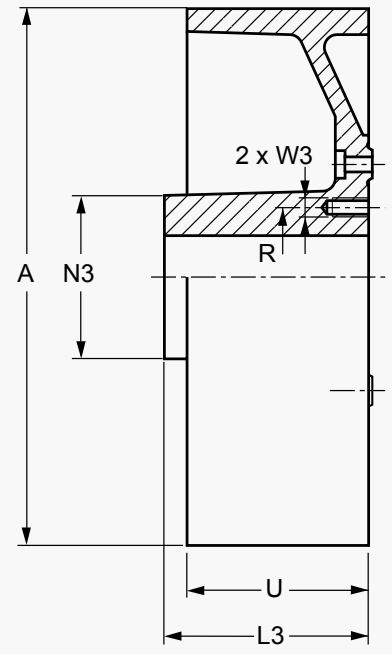
Ts: motor starting torque. In all cases, **Ts < Tk**max

DRUM COUPLINGS - PB & PB-C

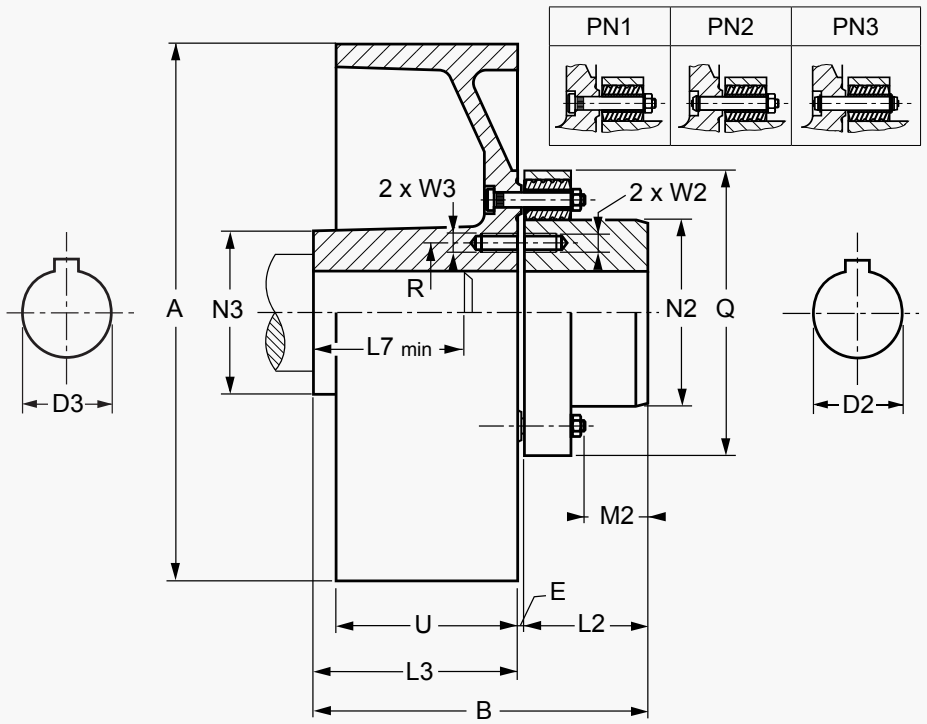
Revision number: T01350-01-C **Revision date: 25.05.2018**

Drums material :
ØA ≤ 400 mm: EN-GJL-250
ØA > 400 mm: EN-GJS-500-7

PB



PB-C



Designation		PB or PB-C...	200	250	315	400	500	630	710
J ⊡	coupling + drum	kgm²	0.062	0.156	0.426	1.310	4.02	10.82	21.45
	drum alone	kgm²	0.052	0.137	0.393	1.229	3.718	10.518	19.958
Weight ⊡	coupling + drum	kg	16.1	27.7	43.5	83	160	235	415
	drum alone	kg	12.5	22.6	35.9	70.1	130.5	205.5	333.4
Nominal torque		Nm	400	630	1000	2500	6100	6100	21000
Rotation speed nmax. ✱		rpm	3400	2750	2200	1700	2200	1800	1500
Dimensions in mm	**A**		200	250	315	400	500	630	710
	B		183.5	223.5	248.5	299	404	429	515.5
	E		3.5	3.5	3.5	4	4	4	5.5
	L2		60	75	90	110	150	150	220
	L3		120	145	155	185	250	275	290
	L7 min		72	87	93	110	150	165	175
	M2		21.5	36.5	51.5	51	91	91	148
	N2		95	116	127	160	202	202	290
	N3		95	116	127	160	202	202	195
	Q		**155**	**175**	**200**	**245**	**315**	**315**	**460**
	U		75	95	118	150	190	236	265
	R2		80	95	105	135	165	165	232
	R3		80	95	105	135	165	165	165
	W2		M8	M10	M10	M12	M12	M12	M20
	W3		M10	M12	M12	M16	M20	M20	M20
Bores in mm	**D2**	min / max ✪	19/60	28/75	35/80	35/100	100/125	100/125	140/200
	D3	min / max ✪	19/60	28/75	28/80	35/100	45/125	55/125	55/125
Pins	Number / size		6 /PN1	8 /PN1	10 /PN1	9 /PN2	16/PN2	16/PN2	18/PN3

Without specification on the order, couplings are delivered without boring.

✱ For speeds > nmax.. consult us.

⊡ For maximum bore.

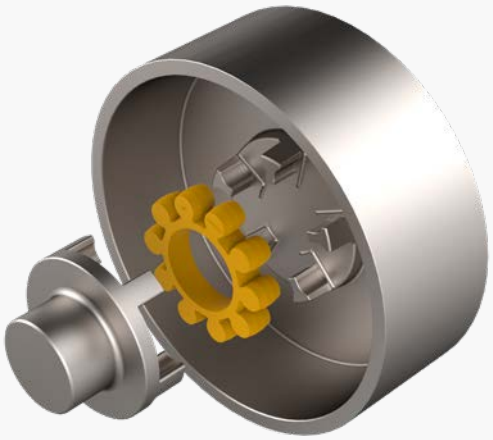
✪ Maximum bores for keyways according to ISO R773.

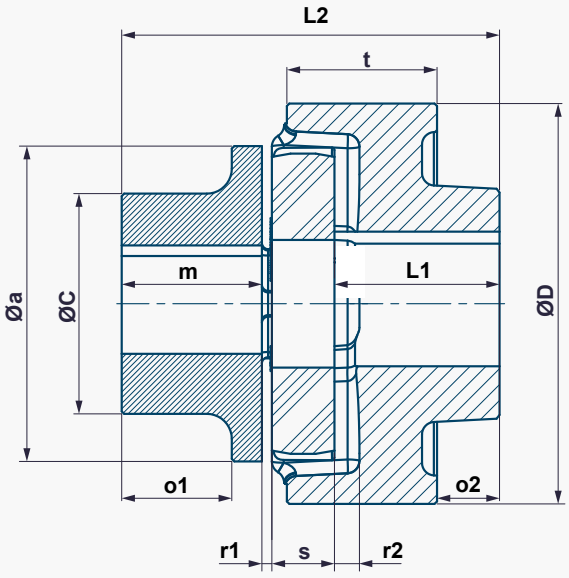
DRUM COUPLINGS - SVT

Revision number: T10178-01-A **Revision date: 01.09.2020**

- S**V**T: Rubber element **V**
- S**D**T: Rubber element **D**
- Working temperature: -25°C to +80°C

Without specification on the order, couplings are delivered without boring.





Elastic couplings SVT / SDT			125	145	170	200	230	260
Drum diameter			160	200	250	315	400	630
ASSEMBLY	**J**	kg.m²	0,03	0,075	0,2	0,5	1,5	12
	Max. weight bored	kg	11	17	30	53,5	85	210
	Maximum speed	r.p.m.	3000	3000	2400	2100	1800	1500
	L2		151	156	178,5	251	271	286
DRUM	**ØD**	mm	160	200	250	315	400	630
	t	mm	60	75	95	118	150	236
	L1	mm	56	61	63,5	111	118,5	121
	Ød max keyed or shrink fit	mm	50	50	70	70	100	100
COUPLING	**Øa**	mm	125	145	170	200	230	260
	Øc	mm	88	90	112	120	140	140
	Ød1 max keyed	mm	55	70	80	90	100	100
	m	mm	56	60,5	74,5	98,5	110	112,5
	o1	mm	44	46,5	56,5	77,5	87	87,5
	o2	mm	25	21	14,5	38	36	20
	r1	mm	4	4,5	5,5	6,5	7,5	7,5
	r2	mm	10	5	5	5	5	5
	s	mm	25	30	30	35	35	45
	Max. torque Rubber element **V**		750	1200	1900	2880	5150	7950
	Tkmax in Nm element **D**		1110	1800	2850	4950	7740	11940

Transmissible torque (**Tk**n) (**Tk**n: motor nominal torque)							
Tkn ≤ **Tk**max/**k** **k min.**	T°	**k=3**	< 40°C	**k=4**	< 80°C	**k=6**	≤ 80°C
Ts< Tkmax	Rate		≤ 120 starts/h		≤ 240 starts/h		≤ 600 starts/h

Ts: motor starting torque. In all cases, **Ts < Tk**max

COUPLINGS - SVR & SDR

Revision number: T10174-01-A **Revision date: 06.05.2020**

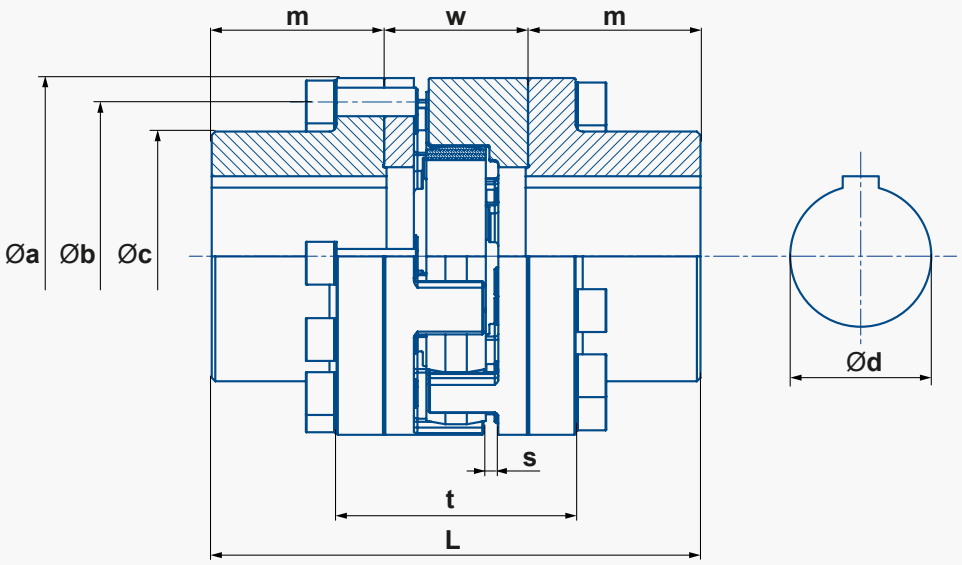
Elastic couplings series **SVR** and **SDR**

Replacement of the rubber element without moving back the machines

- **SVR**: Rubber element **V**
- **SDR**: Rubber element **D**

- Working temperature: -25°C to +80°C

Options:
Long hub (motor or/and gearbox side)
Consult us



Elastic couplings SVR / SDR		125	145	170	200	230	260	300	400
Inertia **J**	kg.m²	0,02	0,037	0,077	0,16	0,312	0,63	1,296	4,288
Max. weight bored	kg	11	16	25	38,5	56	86	134	255
Maximum speed	r.p.m.	3000	3000	2400	2100	1800	1800	1500	1300
L		194	218	247	292	304	364	411	487
t	mm	102	108	117	132	151	182	121	227
Øa	mm	125	145	170	200	230	260	300	400
Øb	mm	105	125	144	165	190	220	260	335
Øc	mm	80	100	112	126	140	168	190	240
Ød max keyed	mm	55	70	80	90	100	120	125	150
m	mm	66	75	85	100	105	125	145	175
w	mm	62	68	77	92	94	114	121	137
s	mm	6	6,5	7,5	8,5	9,5	9,5	10,5	10,5
Max. torque Tkmax in Nm — Rubber element	**V**	750	1200	1900	2880	5150	7950	11700	26700
	D	1110	1800	2850	4950	7740	11940	17550	39700
Transmissible torque (Tkn) (Tkn: motor nominal torque)		**Tk**n ≤ **Tk**max/**k** **k min.** **Ts< Tk**max		Temperature Rate	**k=3**	< 40°C ≤ 120 starts/h	**k=4**	< 80°C ≤ 240 starts/h	**k=6** ≤ 80°C ≤ 600 starts/h
Tightening torque of the screws ✱	Nm	48	84	204	204	285	541	685	1364

✱ Screws class 10.9 greased with molybdenum bisulphide grease under the head and in threads.
Tightening tool dispersion = ±10%

Ts: motor starting torque. In all cases, **Ts < Tk**max

COUPLINGS - SVW & SDW

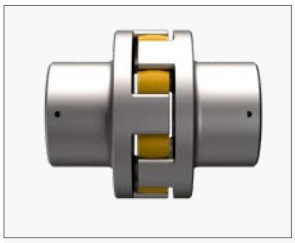
Revision number: T10156-01-C **Revision date: 27.08.2020**

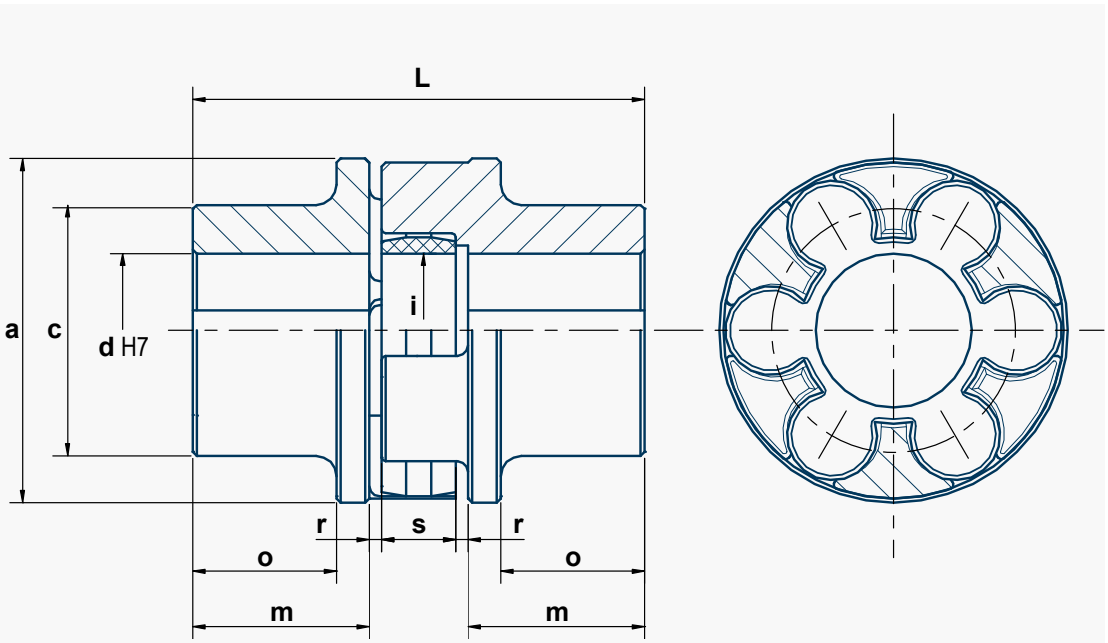
- Cam ring **V**
- Cam ring **D**
  (Specify type of cam ring with order)
- Working temperature: -25°C to +80°C

Option:
- Long hub (motor or/and gearbox side)
- Short hub (motor or/and gearbox side)
  Consult us.

- Painted coupling

Note: In standard, couplings are delivered oiled without protection

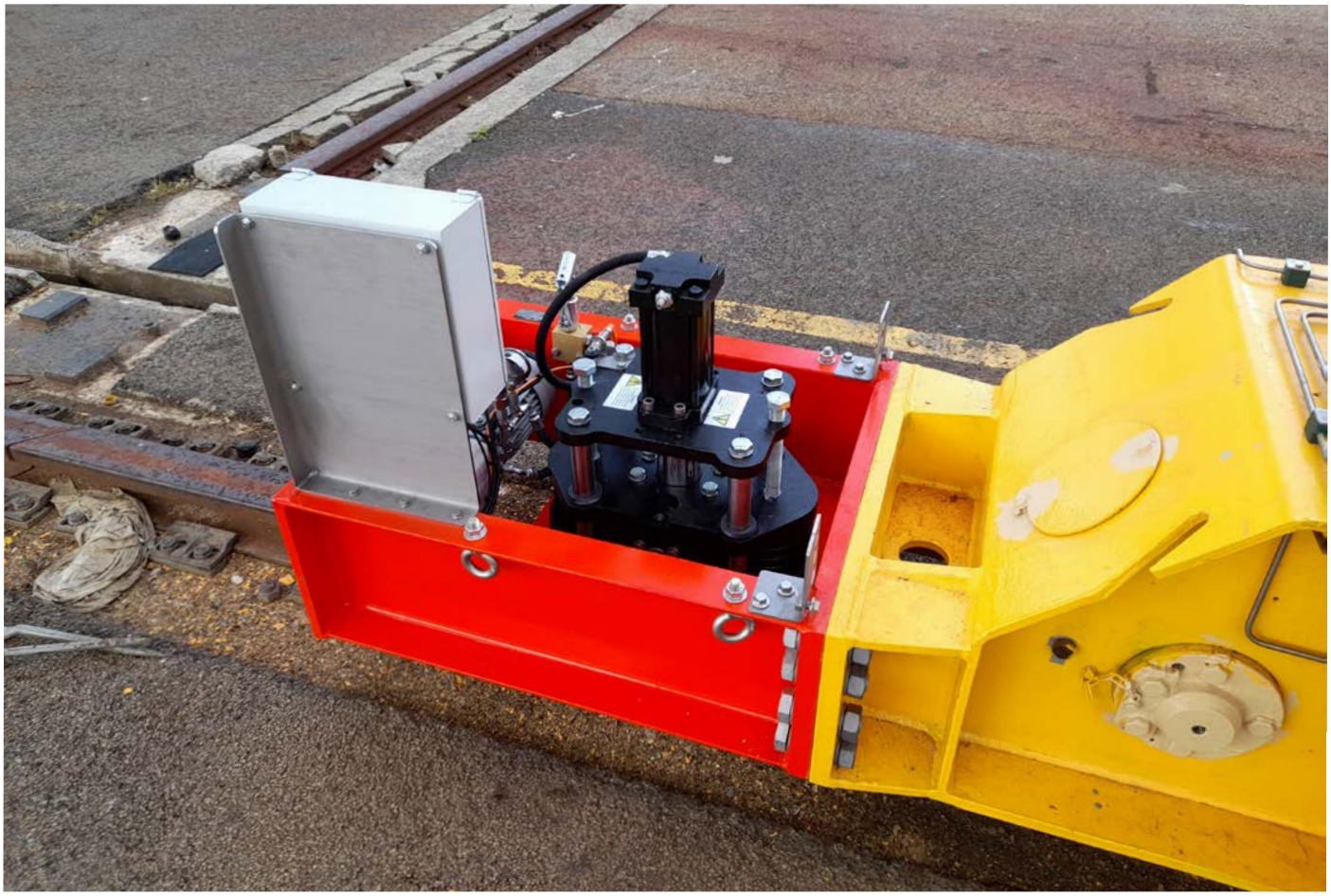




Coupling size SVW- / SDW-			50	70	85	100	125	145	170	200	230	260	300	400
Cam ring n°	SVW SDW		50V	70V	85V 85D	100V 100D	125V 125D	145V 145D	170V 170D	200V 200D	230V 230D	260V 260D	300V 300D	400V 400D
Qty of cams			4	6	6	6	6	6	8	8	10	10	10	14
Mass moment of inertia		kgm²	0.0002	0.001	0,002	0,005	0,010	0,021	0,047	0,108	0,195	0,385	0,735	1,852
Weight		kg	0.68	1.64	2,5	4,5	7	9,5	16	27,5	40	57	84	133
Max. r.p.m.		tr/mn	9000	7500	7000	5600	5000	5000	4000	3600	3200	2500	2000	1750
Diameters	**a**	mm	50	70	85	105	126	145	170	200	230	260	300	400
	c	mm	42	55	62	72	88	90	112	125	140	150	200	225
	d pilot bored.	mm	-	-	-	15	20	20	25	25	35	35	40	40
	d max.	mm	24	32	42	48	60	65	75	90	100	105	140	160
	i	mm	19	29	38	46	56	63	90	102	117	140	162	250
Lengths	**L**	mm	75	100	110	125	145	160	190	245	270	285	330	400
	m	mm	29.5	38.5	43	49	56	60,5	74,5	98,5	110	112,5	131,5	163,5
	o	mm	23.5	31.5	35	37,5	44	46,5	56,5	77,5	87	87,5	106,5	127,5
	s	mm	12	18	18	20	25	30	30	35	35	45	50	55
	r	mm	2	2.5	3	3,5	4	4,5	5,5	6,5	7,5	7,5	8,5	9
Max. torque **Tk**max	**SVW**	Nm	40	140	225	390	750	1200	1900	2880	5150	7950	11700	26700
	SDW	Nm			350	610	1110	1800	2850	4950	7740	11940	17550	40050
Transmissible torque (**Tk**n) (**Tk**n: motor nominal torque)			**Tk**n ≤ **Tk**max/**k** **k min.** | Temperature **k=3** | < 40°C **k=4** | < 80°C **k=6** | ≤ 80°C **Ts< Tk**max | Rate | ≤ 120 starts/h | ≤ 240 starts/h | ≤ 600 starts/h										

Ts: motor starting torque. In all cases, **Ts < Tk**max

STORM BRAKES



Storm Brakes

MAIN CHARACTERISTICS	APPLICATIONS
• A LARGE RANGE OF STORM BRAKES THAT PREVENT THE CRANES FROM UNCONTROLLED MOVEMENT ALONG THE RAIL IN CASE OF SUDDEN BURST OF WIND	• SHORE CRANES • AUTOMATED STACKING CRANES • RAIL-MOUNTED GANTRY CRANES

Limited Rail Clamps LRBS

- Braking Force: up to 650 kN
- Braking by spring / Hydraulic or electric release
- Guided with hardened steel guiding blocks
- Float: Horizontal ±30mm
  Vertical ±5mm

Retractable Rail Clamps RRBS

- Braking Force: up to 1200 kN
- Braking by spring / Hydraulic or electric release
- Brake pads and complete mechanism is retractable
- Float: Horizontal ±30mm
  Vertical ±25mm

Guided Rail Clamps GRBS

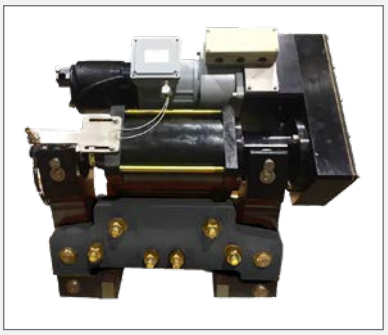
- Braking Force: up to 1000 kN
- Braking by spring / Hydraulic or electric release
- Guided with cylindrical low friction rollers
- Float: H: ±30mm / V: ±25mm

CONSULT US

Rail Elephant Foot RPS

- Braking by spring on the top of the rail
- Hydraulic release
- Balanced braking force
- Oversized longer lasting springs for reduced maintenance

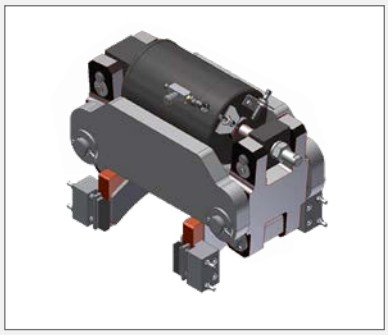
CONSULT US



Wheel Electric Brakes WBES

- Spring set
- Fully electric release
- No hydraulic components
- Setting time adjustable from 3 to 30s
- Shoe alignment device

CONSULT US



Wheel Hydraulic Brakes WBHS

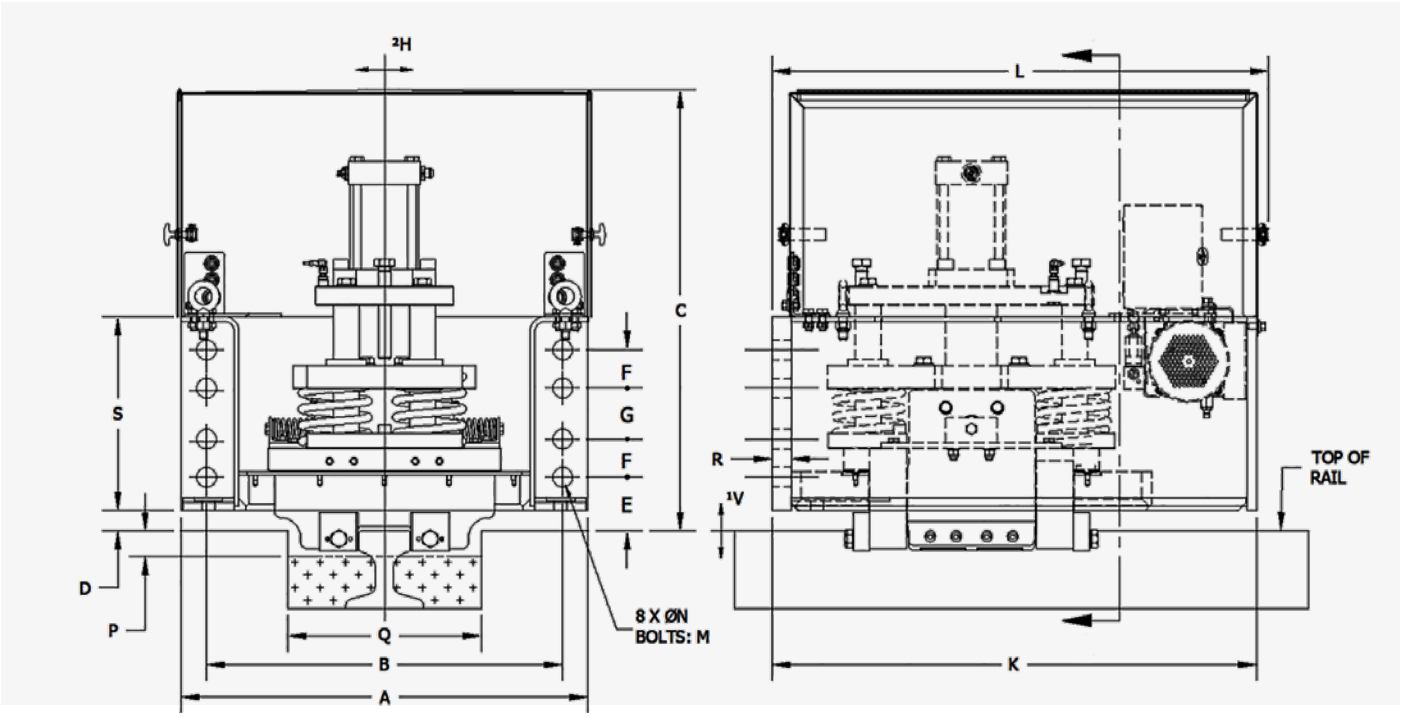
- Spring set
- Hydraulic release
- Setting time adjustable from 3 to 30s
- Shoe alignment device
- Mechanical brake release

CONSULT US

STORM BRAKES - LRBS RAIL CLAMPS

Revision number: BRC10167-01-D **Revision date: 19.05.2020**

- SF Side Flange mount to the crane structure
- TF Top Flange mount available
- Stainless steel cover
- Paint system for C4 environment
- Prewired junction box
- Hand pump and/or caging bolts for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator
- Integrated Temperature/Level Switch
- Adjustable setting time from 2-30 seconds



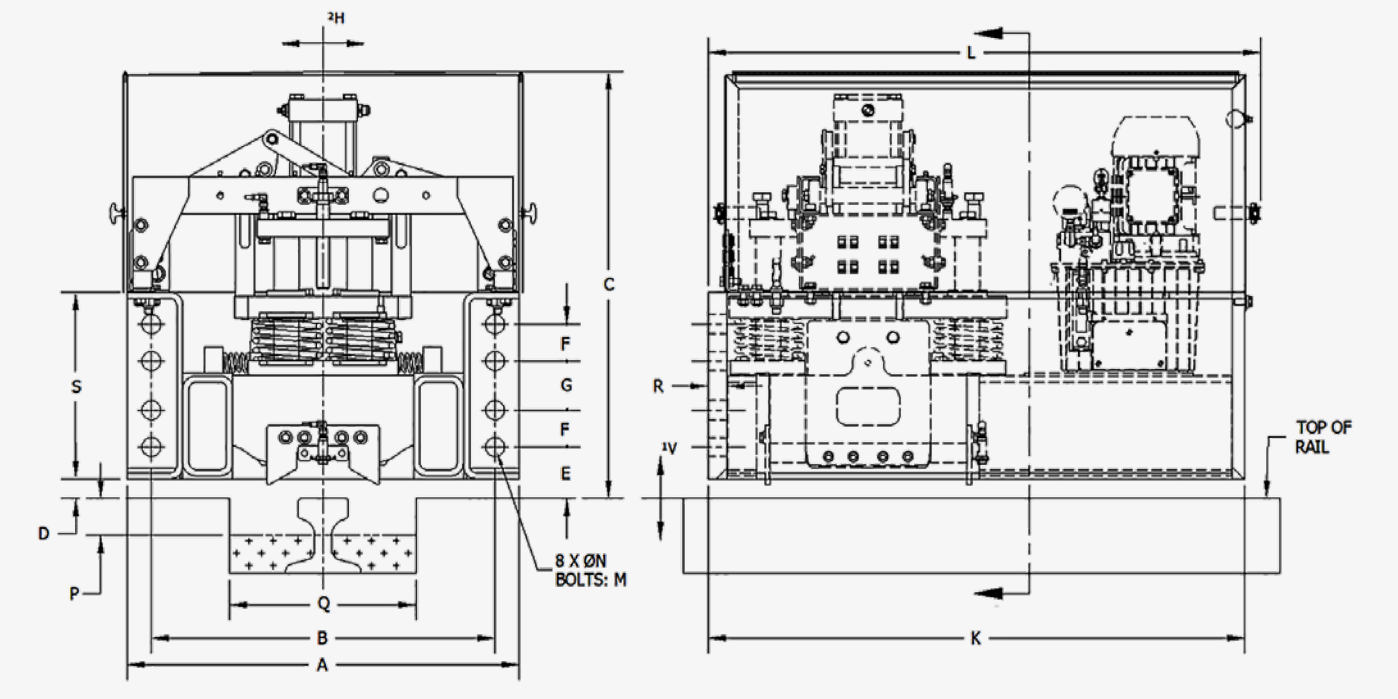
1V Vertical Rail Deviation (Float) ±5mm relative to Rail Clamp enclosure at full rated capacity.
2H Horizontal Rail Position Deviation (Float) ±30mm relative to Rail Clamp enclosure at full rated capacity. Larger floats available upon request.
Q* Dimensions are subject to a specific rail size. **N**** LRBS-50/100 series come with four holes bolt pattern.
Models with holding capacities calculated with friction factor 0.5. Models with holding capacities calculated with friction factor 0.25 available upon request. All dimensions (mm) and capacities (kN) subject to change without notification.

MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	K	L	M	N	P	Q*	R	S
LRBS-HS-50-SF	50	540	470	665	30	60	140	x	681	x	24	26	50	300	22	203
LRBS-HS-100-SF	100															
LRBS-HS-150-SF	150	705	635	700	40	85	65	90	860	884	27	29	50	350	32	310
LRBS-HS-200-SF	200															
LRBS-HS-250-SF	250															
LRBS-HS-350-SF	350															
LRBS-HS-400-SF	400	800	700	860		105	75	100	955	985	36	39	50	380	38	380
LRBS-HS-450-SF	450															
LRBS-HS-500-SF	500															
LRBS-HS-600-SF	600															
LRBS-HS-650-SF	650															

STORM BRAKES - RRBS RAIL CLAMPS

Revision number: BRC10167-01-D **Revision date: 19.05.2020**

- SF Side Flange mount to the crane structure
- TF Top Flange mount available (50 to 600 kN)
- Stainless steel removable cover with inspection doors
- Caging bolts for mechanical release
- Paint system for C4 environment / • Prewired junction box
- Hand pump and caging bolts for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator
- Integrated Temperature/Level Switch
- Adjustable setting time from 2-30 seconds



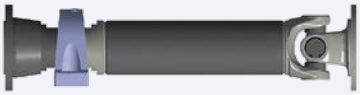
1V Vertical Rail Deviation (Float) ±25mm relative to Rail Clamp enclosure at full rated capacity.
2H Horizontal Rail Position Deviation (Float) ±30mm relative to Rail Clamp enclosure at full rated capacity. Larger floats available upon request.
Q* Dimensions are subject to a specific rail size.
Models with holding capacities calculated with friction factor 0.5. Models with holding capacities calculated with friction factor 0.25 available upon request. All dimensions (mm) and capacities (kN) subject to change without notification.

MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	K	L	M	N	Q*	P	R	S
RRBS-HS-50-SF	50	578	530	735	30	75	50	65	860	885	20	22	280	70	22	254
RRBS-HS-100-SF	100															
RRBS-HS-150-SF	150	705	635	785	40	85	65	90	860	885	27	29	340	75	32	310
RRBS-HS-200-SF	200															
RRBS-HS-250-SF	250															
RRBS-HS-300-SF	300															
RRBS-HS-350-SF	350	800	700	870		105	75	100	1095	1125	36	39	380	75	38	380
RRBS-HS-400-SF	400															
RRBS-HS-450-SF	450															
RRBS-HS-500-SF	500															
RRBS-HS-600-SF	600															
RRBS-HS-800-SF	800	850	730	1000		120	110	170	1210	1240	39	42	380	75	38	580
RRBS-HS-900-SF	900															
RRBS-HS-1000-SF	1000															
RRBS-HS-1200-SF	1200	900	780	1050		115	100	180	1400	1430	42	45	400	75	45	530

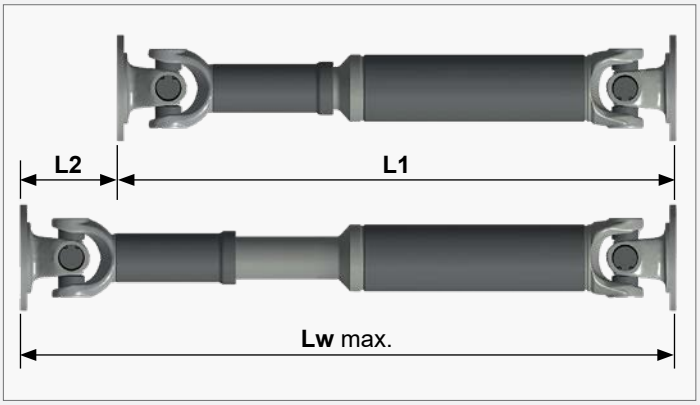
CARDAN SHAFTS

Cardan Shafts

MAIN CHARACTERISTICS	ADVANTAGES
• TRANSMISSION OF AN ANGULAR ROTATION • COUPLING OF 2 ROTATING NON-ALIGNED SHAFTS	• MAINTENANCE FREE - do not need lubrification • FEWER FAILURES - closed system without loss of grease and without penetration of water and dirt • LONG SERVICE LIFE - SAE or involute splines: optimization in accordance with size and utilization of the cardan shaft

Type	Design	Description
ACS-100		With length compensation
ACS-105		With length compensation in double-flange design
ACS-110		Short couple shaft
ACS-130		Tube shaft without length compensation
ACS-135		Tube shaft without length compensation in double-flange design
ACS-160		Intermediate shaft
ACS-220		Intermediate tube shaft

L1 = compressed length
L2 = maximum possible length compensation
Lw max. = maximum possible working length
Optimal working length = **Lw** opt. **= L1 + ½ L2**



ACCESSORIES - CARDAN SHAFTS TYPE ACS

Revision number: T10155-01-B **Revision date: 05.11.2018**

Cardan Shaft Sizes

Size	Swing diameter mm	Bearing torque Nm	Feature
1	up to 76	up to 600	One-piece bearing yokes Length compensation with involute spline Flange yoke with DIN or SAE connection
2	100 - 144	1.400 - 6.000	One-piece bearing yokes Length compensation with involute spline Flange yoke with DIN, SAE or cross-serrated connection Maintenance-free U-joints
3	158 - 204	8.800 - 20.000	One-piece bearing yokes Length compensation with involute spline or straight flank spline (SAE) Application-related spline coating Flange yoke with DIN, SAE or cross-serrated connection, as well as with face key Maintenance-free U-joints
4	220 - 315	26.000 – 143.000	One-piece bearing yokes Length compensation with involute spline or straight flank spline (SAE) Application-related spline coating Flange yoke with DIN, face key or Hirth-serration Maintenance-free U-joints
5	350 - 620	210.000 – 1.250.000	One-piece bearing yokes Length compensation with involute spline or straight flank spline (SAE) Application-related spline coating Flange yoke with DIN, face key or Hirth-serration Double flange design
6	from 680	from 1.950.000	One-piece bearing yokes Length compensation with straight flank spline (SAE) Application-related spline coating Flange yoke with face key or Hirth-serration Double flange design

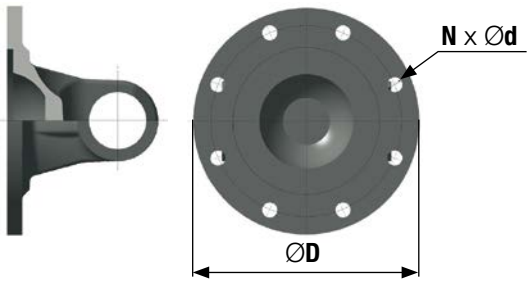
ACCESSORIES - CARDAN SHAFTS TYPE ACS

Revision number: T10155-01-B **Revision date: 05.11.2018**

Series 1, 2 and 3

	Series		1	2				3			
	Size		07600	10000	11600	12600	14400	15800	17200	17800	20400
DESIGN	Bearing Torque	Nm	600	1.400	3.000	5.300	6.000	8.800	12.500	17.000	20.000
	Reversing Fatigue Torque	Nm	300	700	1.500	2.300	2.900	4.400	5.100	8.500	11.000
	Joint Performance Factor	Nm	220	660	990	1.780	2.070	2.400	3.500	4.600	6.800
	Swing Diameter	mm	76	100	116	126	144	158	172	178	204
	100 	L1 min	250	421	451	536	572	630	566	661	746
		L2 min	40	110	110	110	110	180	110	110	110
		tube size	50	50 / 76,2	70 / 90	90	100	100	120	120	140
	110 	L1 min	214	240	290	340	409	400	430	450	480
		L2 min	15	15	30	40	45	35	40	40	40
		L1 max	249	420	450	535	571	559	565	660	745
		L2 max	40	110	110	110	110	110	110	110	110
	130 	L1 min	190	218	278	309	369	355	400	353	440
		tube size	50	50 / 76,2	70 / 90	90	100	120	120	120	140
CONNECTIONS (ØD-N-Ød)	DIN 		75-6-6	90-4-8	100-6-8	120-8-10	150-8-12	150-8-12	180-8-14	180-8-14	180-8-14
			90-4-8	100-6-8	120-8-8	150-8-12	180-8-14	180-8-14	180-8-16	180-8-16	180-8-16
				100-8-8	120-8-10	180-8-10		180-8-16	180-10-16	180-10-16	180-10-16
				120-8-8	150-8-10	180-8-14		180-10-16	225-8-16	225-8-16	225-8-16
				120-8-10	150-8-12					250-8-18	250-8-18
	SAE 		87-4-8	87-4-8	119-4-11,1	146-4-12,7	174,8-8-9,6	174,8-8-9,6	203,2-8-9,6	203,2-8-9,6	203,2-12-11,1
				96,8-4-9,6	149-4-12,7			203,2-8-9,6	203,2-12-11,1	203,2-12-11,1	244,5-8-16,1
				119-4-11,1				203,2-12-11,1			
	Cross serration 			100-4-8,5	122-4-11	122-4-11	122-4-11	150-4-13	150-4-13	150-4-13	180-4-15
				122-4-11			150-4-13	180-4-15	180-4-15	180-4-15	

CONNECTIONS



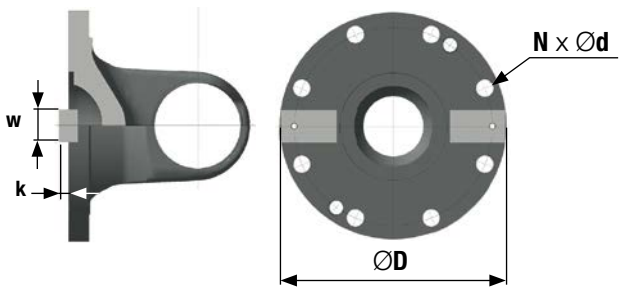
ACCESSORIES - CARDAN SHAFTS TYPE ACS

Revision number: T10155-01-B **Revision date: 05.11.2018**

Series 4 and 5

	Series		4					5			
	Size		21500	21510	22580	25080	28580	31510	35000	39000	44000
DESIGN	Bearing Torque	Nm	26.000	29.000	45.000	70.000	100.000	143.000	210.000	300.000	500.000
	Reversing Fatigue Torque	Nm	13.000	14.500	23.000	35.000	50.000	70.000	100.000	150.000	250.000
	Joint Performance Factor	Nm	8.050	8.350	12.050	18.650	26.200	28.140	40.300	56.800	81.500
	Swing Diameter	mm	220	220	225	250	285	315	350	390	440
	100 	L1 min	797	775	900	995	1.115	1.205	1.295	1.450	1.660
		L2 min	150	140	110	140	140	140	150	170	190
		tube size	144	150	160 / 170	180	200	219	245	273	325
	110 	L1 min	551	580	585	645	990	980	1.175	1.140	1.300
		L2 min	50	40	40	40	50	100	50	80	70
		L1 max	796	650	899	994	1.114	1.204	1.294	1.449	1.659
		L2 max	150	110	140	140	140	140	150	170	190
	130 	L1 min	506	538	615	680	760	890	950	1.040	1.250
		tube size	144	150	160 / 170	180	200	215	245	273	324
CONNECTIONS (ØD-N-Ød)	DIN 		225-8-16	225-8-16	225-8-16	250-8-18	285-8-20	315-8-22	350-10-22	390-10-24	435-10-27
			250-8-18	250-8-18	250-8-18	285-8-20	315-8-22	350-10-22	390-10-24	435-10-27	
			285-8-20	285-8-20	285-8-20	315-8-22					
	DIN with face key (w x k) 		225-8-17 (32x9)	225-8-17 (32x9)	225-8-17 (32x9)	250-8-19 (40x12)	285-8-21 (40x15)	315-10-23 (40x15)	350-10-23 (50x16)	390-10-25 (70x18)	435-16-28 (80x20)
				250-8-19 (40x12,5)	250-8-19 (40x12,5)	285-8-21 (40x15)	315-10-23 (40x15)	350-10-23 (50x16)	390-10-25 (70x18)	435-16-28 (80x20)	480-16-31 (90x22,5)
					285-8-21 (40x15)						
	High-serration 								350-12-1116	390-12-1118	435-16-1118
									390-12-1118	435-16-1118	480-16-1120

CONNECTIONS - with face KEY



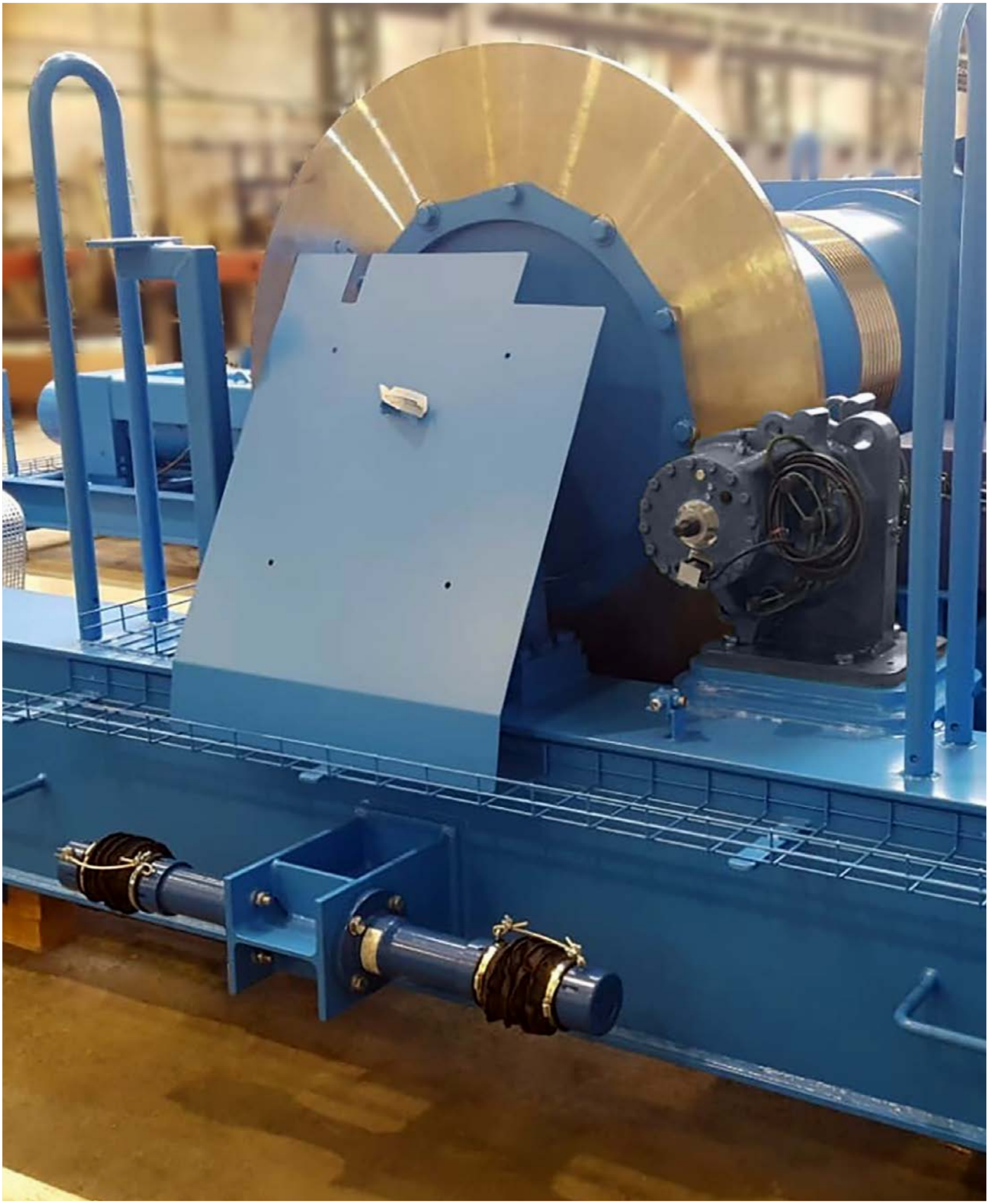
ACCESSORIES - CARDAN SHAFTS TYPE ACS

Revision number: T10155-01-B **Revision date: 05.11.2018**

Series 5 and 6

	Series		5		6			
	Size		49000	55000	62000	68000	75000	84000
DESIGN	Bearing Torque	Nm	700.000	1.000.000	1.250.000	1.950.000	2.650.000	3.900.000
	Reversing Fatigue Torque	Nm	345.000	500.000	625.000	950.000	1.350.000	1.850.000
	Joint Performance Factor	Nm	112.000	154.000	210.000	320.000	750.000	2.230.000
	Swing Diameter	mm	490	550	620	680	750	840
	100 	L1 min	1.810	1.965	2.240			
		L2 min	190	240	250			
		tube size	351	402	445			
	110 	L1 min	1.300	1.770	2.050			
		L2 min	50	55	55			
		L1 max	1.809	1.964	2.239			
		L2 max	190	240	250			
	130 	L1 min	1.360	1.480	1.690			
		tube size	355	406	445			
	105 	L1 min				3.250	4.000	4.250
		L2 min				250	250	250
		tube size				559	609	660
	135 	L1 min				1.950	2.400	2.700
		tube size				559	609	660
CONNECTION (ØD-N-Ød)	DIN with face key (w x k) 		480-16-31 (90x22,5)	550-16-31 (100x22,5)	620-16-38 (100x25)			
			550-16-31 (100x22,5)	620-16-38 (100x25)				
	High-serration 		480-16-1120	550-11-1122	620-6	680-24-33	750-24-33	840-24-38
			550-16-24	620-24-26	680-24-33			

HYDRAULIC BUFFERS



Hydraulic Buffers

MAIN CHARACTERISTICS

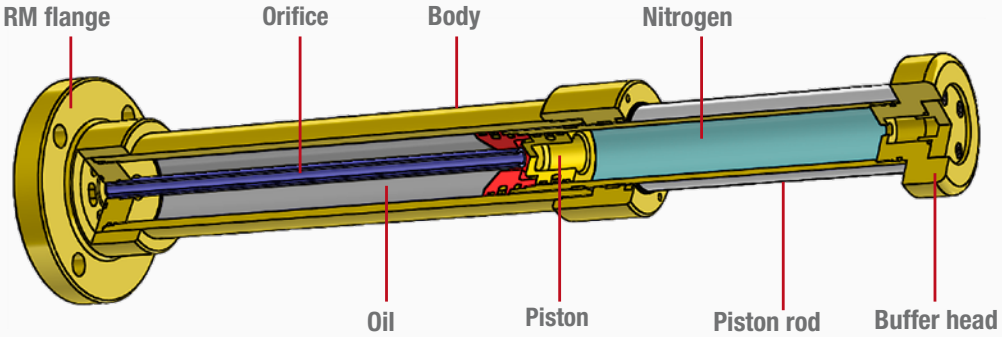
- DAMPING DEVICES REQUIRING NO EXTERNAL ENERGY
- DECELERATE MOVING MACHINES ALONG THE SHORTEST POSSIBLE PATH
- SELF-ADJUSTMENT
- 2 TYPES: REAR MOUNTING OR FRONT MOUNTING
- FILLING: OIL / NITROGEN

APPLICATIONS

- STEEL INDUSTRY
- NUCLEAR CRANES
- PORT APPLICATIONS
- OVERHEAD CRANES - CONTAINER CRANES STACKER CRANES
- TRANSFER CARS - RAILWAY APPLICATIONS

Coating & Options

Temperature	-10 C à +80 C (standard) -40 C à +120 C (special)
Piston rod	Plasma coating (20 µ)
Body coating	Synthetic resin Color 80µM - standard: RAL5009 (Azure blue)
Options	Body coating: RAL1003 (signal yellow) RAL3020 (traffic red) RAL7021 (black grey) RAL9011 (graphite black) Safety chain Protection cover

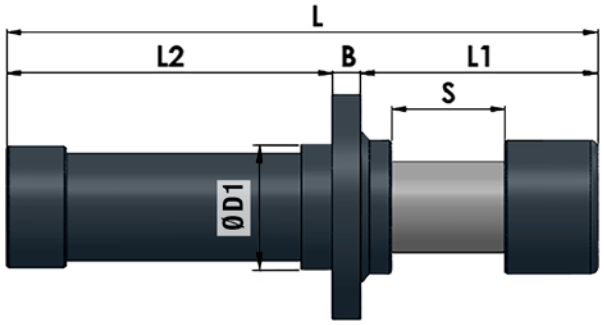


ACCESSORIES - HYDRAULIC BUFFERS

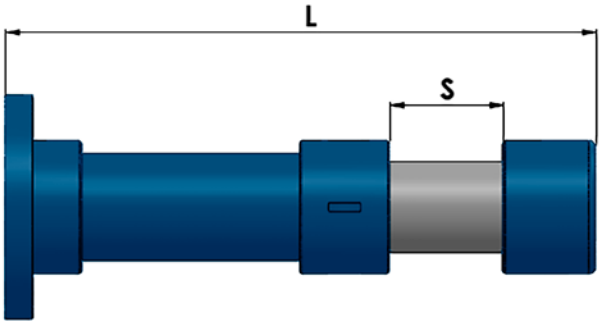
Revision number: T10125-01-E **Revision date: 12.03.2021**

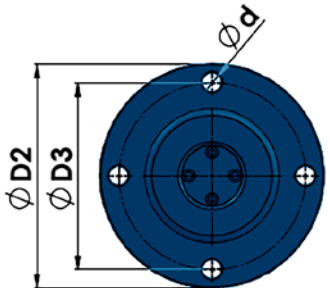
PHS 063

Type **FM**



Type **RM**





PHS 063 100-RM

Size | Stroke | Type

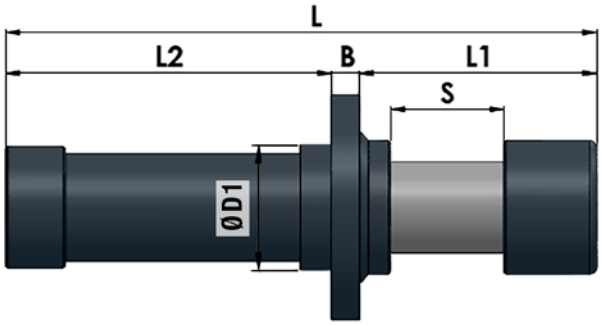
Dimensions in mm	S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/Stroke	F (kN) Buffering Force
PHS 063 050	50	343	152	171	20	91	168	135	17	8	170
PHS 063 100	100	455,5	202	233,5	20	91	168	135	17	15	170
PHS 063 150	150	568	252	296	20	91	168	135	17	23	170
PHS 063 200	200	680,5	302	358,5	20	91	168	135	17	30	170
PHS 063 250	250	793	352	421	20	91	168	135	17	38	170
PHS 063 300	300	905,5	402	483,5	20	91	168	135	17	46	170
PHS 063 350	350	1018	452	546	20	91	168	135	17	51	160
PHS 063 400	400	1130,5	502	608,5	20	91	168	135	17	54	150
PHS 063 450	450	1243	552	671	20	91	168	135	17	57	140
PHS 063 500	500	1355,5	602	733,5	20	91	168	135	17	59	130
PHS 063 550	550	1468	652	796	20	91	168	135	17	60	120
PHS 063 600	600	1580,5	702	858,5	20	91	168	135	17	60	110
PHS 063 650	650	1693	752	921	20	91	168	135	17	59	100
PHS 063 700	700	1805,5	802	983,5	20	91	168	135	17	57	90
PHS 063 750	750	1918	852	1046	20	91	168	135	17	54	80
PHS 063 800	800	2030,5	902	1108,5	20	91	168	135	17	51	70

ACCESSORIES - HYDRAULIC BUFFERS

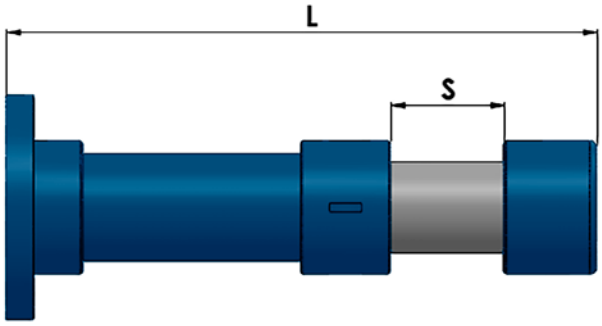
Revision number: T10125-01-E **Revision date: 12.03.2021**

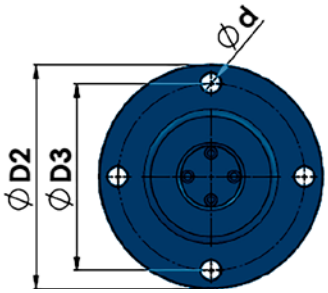
PHS 080

Type **FM**



Type **RM**





PHS 080 100-RM

Size Stroke Type

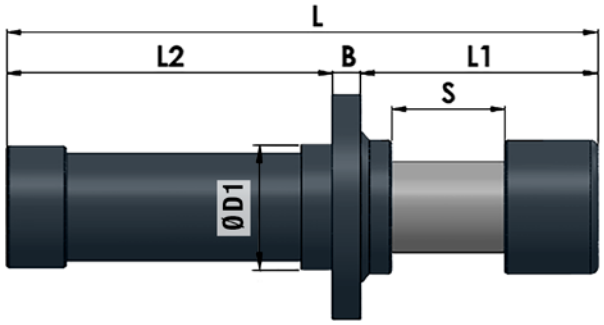
Dimensions in mm	S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/Stroke	F (kN) Buffering Force
PHS 080 050	50	410	159,5	225,5	25	110	198	165	17	13	260
PHS 080 100	100	522,5	209,5	288	25	110	198	165	17	23	260
PHS 080 150	150	635	259,5	350,5	25	110	198	165	17	35	260
PHS 080 200	200	747,5	309,5	413	25	110	198	165	17	48	260
PHS 080 250	250	860	359,5	475,5	25	110	198	165	17	59	260
PHS 080 300	300	972,5	409,5	538	25	110	198	165	17	68	250
PHS 080 350	350	1085	459,5	600,5	25	110	198	165	17	76	240
PHS 080 400	400	1197,5	509,5	663	25	110	198	165	17	84	230
PHS 080 450	450	1310	559,5	725,5	25	110	198	165	17	90	220
PHS 080 500	500	1422,5	609,5	788	25	110	198	165	17	95	210
PHS 080 550	550	1535	659,5	850,5	25	110	198	165	17	100	200
PHS 080 600	600	1647,5	709,5	913	25	110	198	165	17	104	190
PHS 080 650	650	1760	759,5	975,5	25	110	198	165	17	106	180
PHS 080 700	700	1872,5	809,5	1038	25	110	198	165	17	108	170
PHS 080 750	750	1985	859,5	1100,5	25	110	198	165	17	109	160
PHS 080 800	800	2097,5	909,5	1163	25	110	198	165	17	109	150

ACCESSORIES - HYDRAULIC BUFFERS

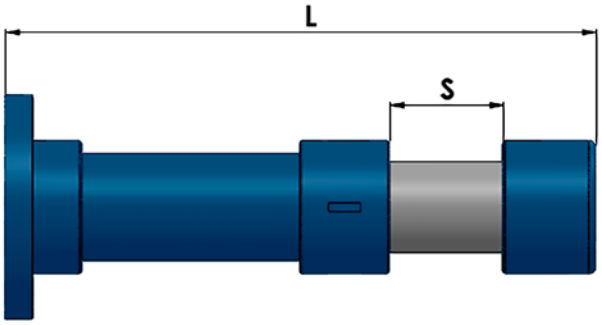
Revision number: T10125-01-E **Revision date: 12.03.2021**

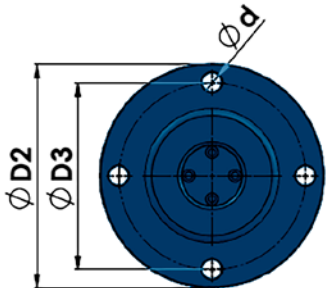
PHS 100

Type **FM**



Type **RM**





PHS 100 100-RM

Size Stroke Type

Dimensions in mm	S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/Stroke	F (kN) Buffering Force
PHS 100 100	100	538,5	207	301,5	30	132	258	210	23	38	420
PHS 100 150	150	651	257	364	30	132	258	210	23	58	420
PHS 100 200	200	763,5	307	426,5	30	132	258	210	23	78	420
PHS 100 250	250	876	357	489	30	132	258	210	23	98	420
PHS 100 300	300	988,5	407	551,5	30	132	258	210	23	115	420
PHS 100 350	350	1101	457	614	30	132	258	210	23	132	420
PHS 100 400	400	1213,5	507	676,5	30	132	258	210	23	148	410
PHS 100 450	450	1326	557	739	30	132	258	210	23	161	400
PHS 100 500	500	1438,5	607	801,5	30	132	258	210	23	175	390
PHS 100 550	550	1551	657	864	30	132	258	210	23	190	380
PHS 100 600	600	1663,5	707	926,5	30	132	258	210	23	200	370
PHS 100 650	650	1776	757	989	30	132	258	210	23	210	360
PHS 100 700	700	1888,5	807	1051,5	30	132	258	210	23	220	350
PHS 100 750	750	2001	857	1114	30	132	258	210	23	230	340
PHS 100 800	800	2113,5	907	1176,5	30	132	258	210	23	240	330

ACCESSORIES - HYDRAULIC BUFFERS

Revision number: T10125-01-E **Revision date: 12.03.2021**

PHS 125

Dimensions in mm	S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/Stroke	F (kN) Buffering Force
PHS 125 100	100	528,5	204,5	289	35	167	300	245	27	60	670
PHS 125 150	150	641	254,5	351,5	35	167	300	245	27	91	670
PHS 125 200	200	753,5	304,5	414	35	167	300	245	27	121	670
PHS 125 250	250	866	354,5	476,5	35	167	300	245	27	154	670
PHS 125 300	300	978,5	404,5	539	35	167	300	245	27	185	670
PHS 125 350	350	1091	454,5	601,5	35	167	300	245	27	215	670
PHS 125 400	400	1203,5	504,5	664	35	167	300	245	27	248	670
PHS 125 450	450	1316	554,5	726,5	35	167	300	245	27	275	650
PHS 125 500	500	1428,5	604,5	789	35	167	300	245	27	301	650
PHS 125 550	550	1541	654,5	851,5	35	167	300	245	27	325	630
PHS 125 600	600	1653,5	704,5	914	35	167	300	245	27	351	630
PHS 125 650	650	1766	754,5	976,5	35	167	300	245	27	377	630
PHS 125 700	700	1878,5	804,5	1039	35	167	300	245	27	393	610
PHS 125 750	750	1991	854,5	1101,5	35	167	300	245	27	414	610
PHS 125 800	800	2103,5	904,5	1164	35	167	300	245	27	435	590

PHS 150

Dimensions in mm	S	L	L1	L2	B	D1	D2	D3	d	W (kJ) Capacity/Stroke	F (kN) Buffering Force
PHS 150 100	100	528,5	204,5	289	35	192	325	270	31	86	860
PHS 150 150	150	641	254,5	351,5	35	192	325	270	31	129	860
PHS 150 200	200	753,5	304,5	414	35	192	325	270	31	172	860
PHS 150 250	250	866	354,5	476,5	35	192	325	270	31	215	860
PHS 150 300	300	978,5	404,5	539	35	192	325	270	31	258	860
PHS 150 350	350	1091	454,5	601,5	35	192	325	270	31	301	860
PHS 150 400	400	1203,5	504,5	664	35	192	325	270	31	344	865
PHS 150 450	450	1316	554,5	726,5	35	192	325	270	31	380	845
PHS 150 500	500	1428,5	604,5	789	35	192	325	270	31	415	830
PHS 150 550	550	1541	654,5	851,5	35	192	325	270	31	442	805
PHS 150 600	600	1653,5	704,5	914	35	192	325	270	31	474	790
PHS 150 650	650	1766	754,5	976,5	35	192	325	270	31	507	780
PHS 150 700	700	1878,5	804,5	1039	35	192	325	270	31	525	750
PHS 150 750	750	1991	854,5	1101,5	35	192	325	270	31	555	740
PHS 150 800	800	2103,5	904,5	1164	35	192	325	270	31	576	720

NOTES

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