Mounting Instructions

Force transfer standard

TOP Transfer

HBM

B 20.TOPTRANS.10 en

Content **page**

Safety instructions

Use in accordance with the regulations

Force transducers of TOP Transfer types: TOP–Z30 and TOP–Z4A are used to make comparative force measurements (force transfer). Use for any additional purpose shall be deemed to be **not** in accordance with the regulations.

In the interests of safety, the transducer should only be operated as described in the Mounting Instructions. It is also essential to observe the appropriate legal and safety regulations for the application concerned during use. The same applies to the use of accessories.

The transducer is not a safety element within the meaning of its use as intended. Proper and safe operation of this transducer requires proper transportation, correct storage, assembly and mounting and careful operation and maintenance.

General dangers due to non-observance of the safety instructions

The TOP–Z30 and TOP–Z4A force transducer correspond to the state of the art and is fail-safe. The transducers can give rise to residual dangers if they are inappropriately installed and operated by untrained personnel.

Everyone involved with the installation, commissioning, maintenance or repair of a force transducer must have read and understood the Mounting Instructions and in particular the technical safety instructions.

Residual dangers

The scope of supply and performance of the transducer covers only a small area of force measurement technique. In addition, equipment planners, installers and operators should plan, implement and respond to the safety engineering considerations of force measurement technique in such a way as to minimize remaining dangers. Prevailing regulations must be complied with at all times. There must be reference to the remaining dangers connected with force measurement technique.

In these mounting instructions residual dangers are pointed out using the following symbols:

Symbol:  **DANGER**

Meaning: **Highest level of danger**

Warns of a **directly** dangerous situation in which failure to comply with safety requirements **will** lead to death or serious physical injury.

Symbol:  **WARNING**

Meaning: **Possibly dangerous situation**

Warns of a **potentially** dangerous situation in which failure to comply with safety requirements **can** lead to death or serious physical injury.

Symbol:  **ATTENTION**

Meaning: **Possibly dangerous situation**

Warns of a **potentially** dangerous situation in which failure to comply with safety requirements **could** lead to damage to property, slight or moderate physical injury.

Symbol:  **NOTE**

Refers to the fact that important information is being given about the product or its use.

Symbol: CE

Meaning: **CE mark**

The CE mark signals a guarantee by the manufacturer that his product meets the requirements of the relevant EC directives (see Declaration of conformity at the end of this document).

Prohibition of own conversions and modifications

The transducer must not be modified from the design or safety engineering point of view except with our express agreement. Any modification shall exclude all liability on our part for any damage resulting therefrom.

Qualified personnel

These transducers are only to be installed by qualified personnel strictly in accordance with the specifications and with the safety rules and regulations which follow. It is also essential to observe the appropriate legal and safety regulations for the application concerned. The same applies to the use of accessories.

Qualified personnel means persons entrusted with the installation, fitting, commissioning and operation of the product who possess the appropriate qualifications for their function.

Conditions on site

Protect the transducer from damp and weather influences such as rain, snow, etc.

Maintenance

Force transducers TOP–Z30 and TOP–Z4A are maintenance free.

Accident prevention

Although the specified nominal force in the destructive range is several times the full scale value, the relevant accident prevention regulations from the trade associations must be taken into consideration.

1 Scope of supply

- Force transducer TOP–Z30, TOP–Z4A
- Operating Manual TOP Transfer

The TOP Transfer force transducers are only available in conjunction with a DKD calibration certificate (not included in the scope of supply)

- DKD calibration certificate according to EN10002–3,
  ISO 376 Order no. K–CAL–FD...

Accessories for TOP–Z30

- **Knuckle eyes ZGW/ZGOW**
  for 100 N to 1000 N: Order no. 1–U1R/200kg/ZGW
  for 2 kN to 10 kN: Order no. 1–U2A/1t/ZGUW

- **Thrust piece** according to EN 10002–3 or ISO376
  for 100 N to 1000 N: Order no. EDO3/1kN
  for 2 kN to 10 kN: Order no. EDO4/50kN

- **Load button**
  for 100 N to 1000 N: Order no. 1–U1R/200kg/ZL
  for 2 kN to 10 kN: Order no. 3–9202.0140
- Tensile force introduction according to EN10002–3 or ISO376
  for 2 kN – 10 kN Order no. 1–Z30/10kN/ZKM

- **Cable/male connector**
  – Connection cable Kab 139–A–6, 6m,
    with Binder cable socket and pigtails; Order no. 1–KAB139A–6
  – Connector MS3106PEMV
    fitted to Kab139A; Order no. D–MS/MONT
  – 15-pin D-Sub connector (male)
    fitted to Kab139A; Order no. D–15D/MONT

Accessories for **TOP–Z4A**

- ZKM tensile force introduction according to EN10002–3 or ISO376

for 20 kN:	Order no.	1-Z4/20kN/ZKM
50kN:	Order no.	1-Z4/50kN/ZKM
100kN:	Order no.	1-Z4/100kN/ZKM
200kN:	Order no.	1-Z4/200kN/ZKM
500kN:	Order no.	1-Z4/500kN/ZKM

- ZGUW/ZGOW knuckle eye

for 20kN:	Order no.	1-Z4/20kN/ZGOW 1-Z4/20kN/ZGUW
50kN:	Order no.	1-U2A/2t/ZGOW 1-U2A/2t/ZGUW
100kN:	Order no.	1-Z4/100kN/ZGOW 1-Z4/100kN/ZGUW
200kN:	Order no.	1-U2A/10t/ZGOW 1-U2A/10t/ZGUW
500kN:	Order no.	1-Z4/500kN/ZGOW 1-Z4/500kN/ZGUW

- Thrust piece EDO4 according to EN 10002–3 or ISO376

20kN	Order no.	1–EDO4/20kN
50kN	Order no.	1–EDO4/50kN
100kN	Order no.	1–EDO4/100kN
200kN	Order no.	1–EDO4/200kN
500kN	Order no.	1–EDO4/500kN

2 Application information

Force transducer TOP Transfer

High-precision force transducers of the TOP–Z30 and TOP–Z4A type series measure compressive and tensile forces.

They measure static and quasi-static forces with great accuracy and reproducibility and thus require extremely cautious handling. You must take particular care when transporting and installing the devices. If you knock or drop the transducers, this could permanently damage them. With TOP Transfer, as you are dealing with a transducer of the utmost precision for transfer measurements, it is advisable to keep a constant ambient temperature in the nominal (rated) temperature range.

TOP–Z30 and TOP–Z4A transducers with DKD calibration certificate:

The standard is for transducers to be **calibrated in the pressure direction.** If required, however, they can also be calibrated within the German calibration service (DKD) in the tension direction. For high-precision measurements, the transducer should only ever be loaded and used in one force direction.

The limits for the permissible mechanical, thermal and electrical stresses are stated in the specifications. Be sure to allow for them when planning, installing and operating the measurement configuration .

To obtain optimum measurement results, the transducer must be connected to an amplifier of the greatest accuracy (for example, the DMP40 from HBM).

3 Structure and mode of operation

3.1 TOP–Z30

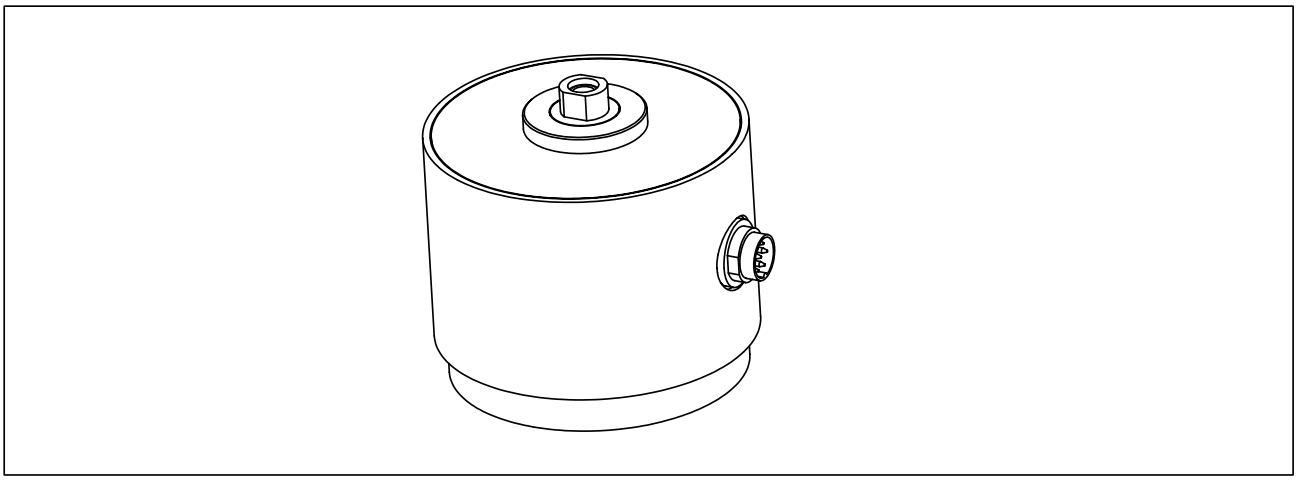


Fig.3.1 TOP–Z30 (100 N...10 kN)

The measuring body comprises a system of measuring springs with strain gauges. Two internal threads attached on both sides are used to introduce the tensile forces. To introduce compressive forces, load buttons to screw into the thread are available as accessories.

All the nominal (rated) forces of the TOP–Z30 have the same size.

The electrical connection is made via Binder male connectors. To reduce the bending moment during tensile measurements, caused by the cable when the outgoing cable is at the side, an additional male connector is provided on the base of the housing.

3.2 TOP–Z4A

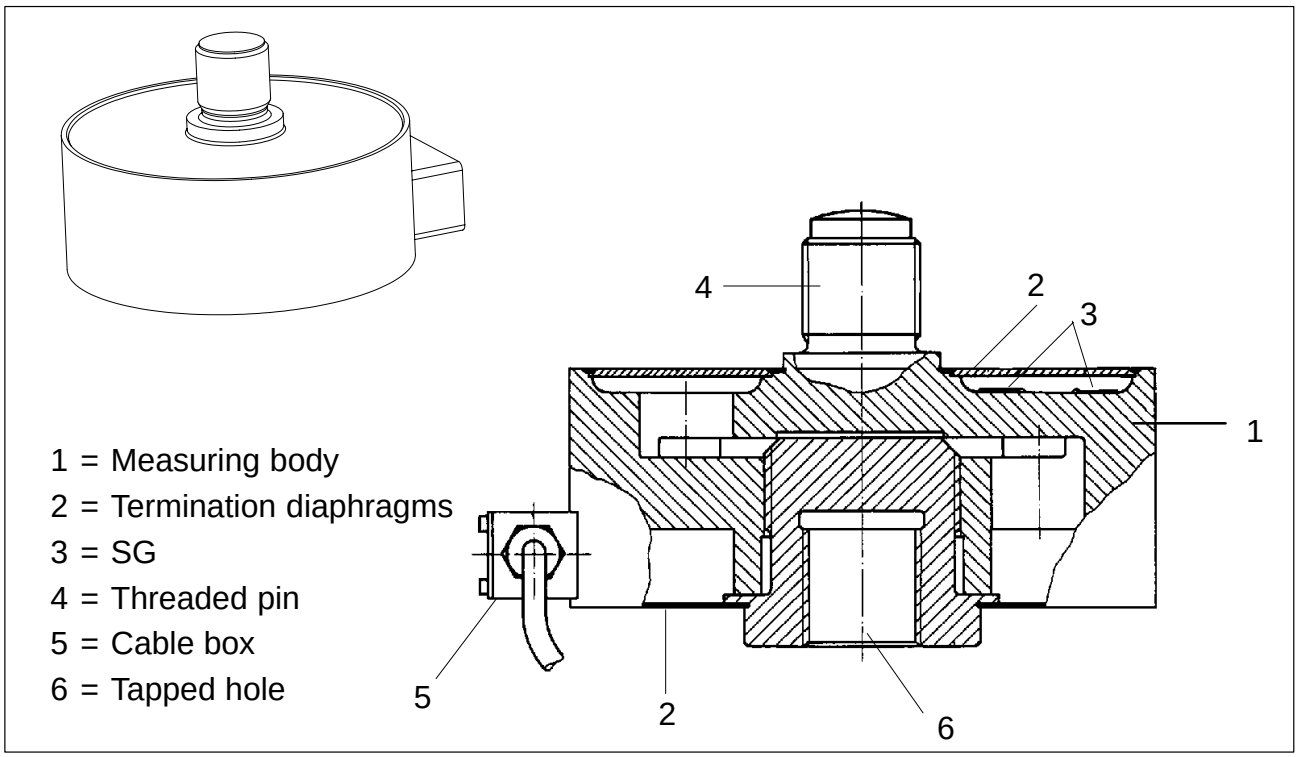


Fig.3.2 TOP–Z4A (20 kN...500 kN)

The measuring body comprises a system of measuring springs with 8 applied strain gauges (S.G.).

For the introduction of tensile forces, the TOP–Z4A transducer has a crowned threaded pin at the top (also suitable for the introduction of compressive forces) and a tapped hole at the bottom.

The housing with the integrated system of measuring springs is protected at the top and bottom by thin metal diaphragms.

4 Conditions on site

4.1 Ambient temperature

The effects of temperature on the zero signal and on the sensitivity are compensated. To achieve optimal measurement results the nominal temperature range must be maintained. Temperature-induced measurement errors can be caused by uneven cooling or heating (for example by radiant heat). A radiation shield and all-round heat insulation bring about marked improvements. They must not form a force shunt.

4.2 Moisture

Extreme moisture or a tropical climate are to be avoided if they fall outside the classified limits (TOP–Z4A degree of protection IP67 to DIN EN 60529; TOP–Z30 degree of protection IP50).

4.3 Air pressure

Variations in air pressure do not affect the TOP–Z30 force transducer.

Variations in air pressure affect the TOP–Z4A force transducer in the same way as force variations. With normal ambient pressure variations ±20mbar, however, the effect on the measurement signal is negligible (air pressure variations of ±10 mbar only have an effect on the zero signal of max. 6 N with 20 kN and 50 kN transducers).

4.4 Chemical effects

The transducer housings are protected by a powder coating. They must not be exposed to onerous environmental conditions (direct atmospheric exposure, contact with media that encourage corrosion to develop).

The uncoated force introduction areas of the TOP–Z4A are greased to protect them against corrosion.

4.5 Loading disturbance variables

Torsion, bending and transverse load are disturbance variables and are therefore to be avoided. If necessary they can be remedied with HBM mounting accessories (section 5.3).

4.6 Electromagnetic compatibility

The transducers have been tested for use in controlled electromagnetic environments acc. to EN61326:2002;TabB.1.

5 Mechanical installation

5.1 Important measures for installation

– handle the transducer gently, it is essential not to apply mechanical stress to the housing diaphragm
– when handling, always wear thermally insulated gloves
– before measuring, allow enough time for the force transducer to reach a stable temperature with regard to its mounting parts and its environment. For precision measurements, it is advisable to wait approx. 24 hours.
– connect the force transducer to the excitation voltage approx. 1 hour before measurement
– when measuring compressive forces, make sure that the support structure is rigid and level
– the force–introduction surfaces and the thread must be totally clean and fully bearing
– keep to the engagement depths for the threaded rods or knuckle eyes. If the engagement depths are changed, this may adversely affect repeatability.
– do not overload the transducer, only load it up to its operating force
– forces must work as accurately as possible on the transducer in the direction of measurement.

WARNING

If there is a risk of breakage through overload on the transducer and thus a risk to persons, additional safety measures are to be taken.

WARNING

Torsion and bending moments, eccentric loading and transverse forces result in measurement errors and if limit values are exceeded, could destroy the transducer.

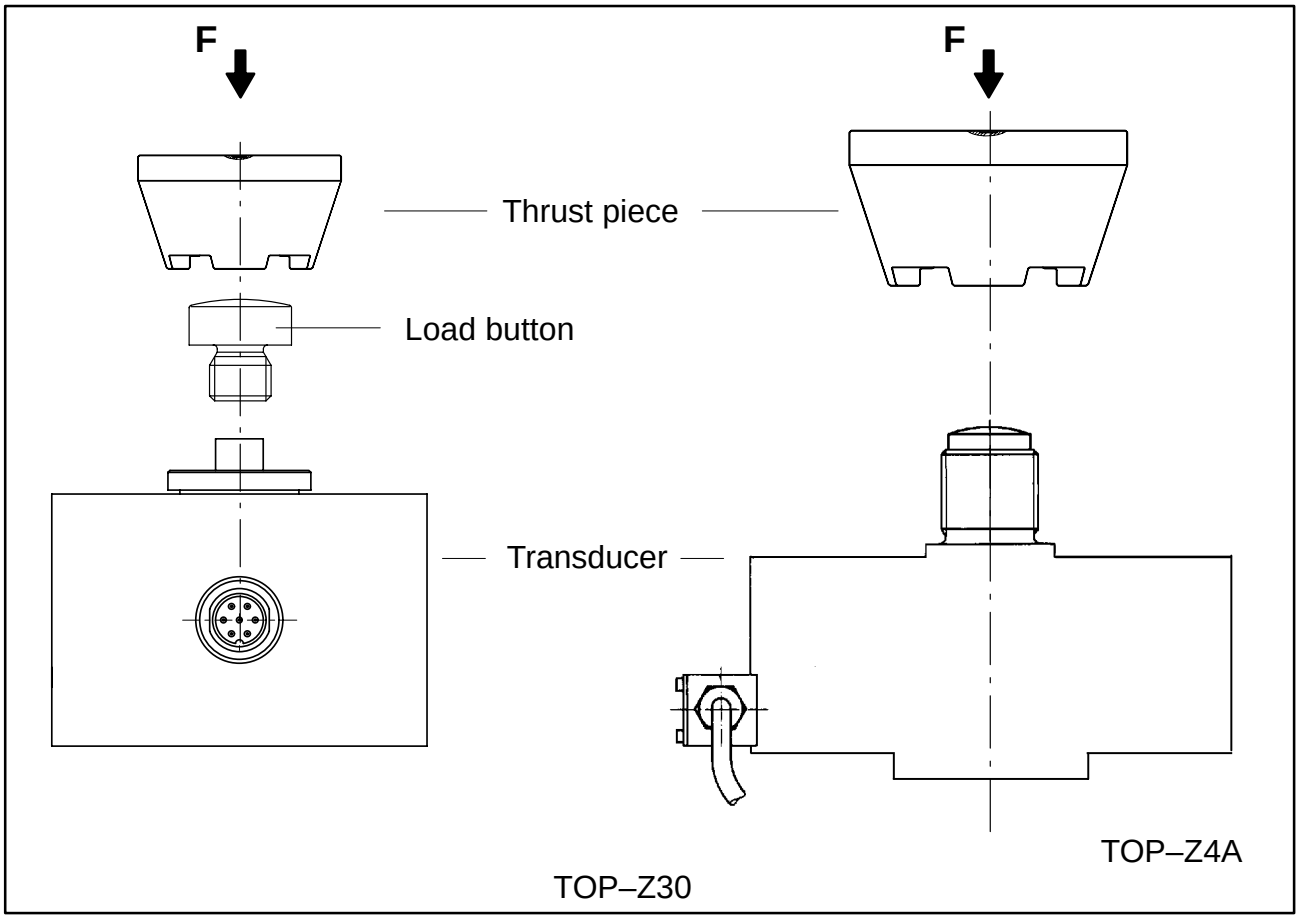
5.2 Mounting accessories for compressive loading

Thrust pieces according to EN10002–3 or ISO376 are available for introducing the compressive forces.

For the TOP–Z30, thrust pieces EDO3/1kN or EDO4/50kN (see Page 26) and two load buttons (see page 25) are available.

With the TOP–Z4A, the thrust piece (see page 32) can be placed directly on the crowned threaded pin.

5.2.1 Installation drawing for compressive loading



Transducer	Load button	Thrust piece
TOP–Z30/ **100 N – 1000 N**	1–U1R/200kg/ZL	EDO3/1kN
TOP–Z30 / **2 kN – 10 kN**	3–9202.0140	EDO4/50kN
TOP–Z4A / **20 kN**	–	EDO4/20kN
TOP–Z4A / **50 kN**	–	EDO4/50kN
TOP–Z4A / **100 kN**	–	EDO4/100kN
TOP–Z4A / **200 kN**	–	EDO4/200kN
TOP–Z4A / **500 kN**	–	EDO4/500kN

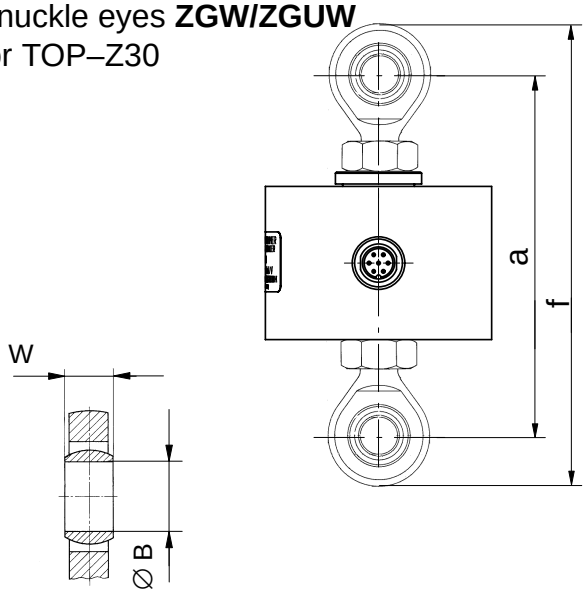
5.3 Mounting accessories for tensile loading

Knuckle eyes and tensile force introductions (ZKM) according to ISO376 are available for installing the TOP–Z30 and the TOP–Z4A. These mounting accessories prevent the introduction of torsional moments and when 2 knuckle eyes are used, stop bending moments and transverse and angular loading being introduced in the transducers.

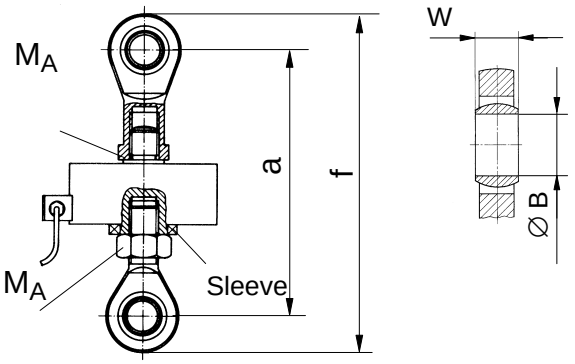
Installing the knuckle eyes

- Screw in the thread of the knuckle eye until it reaches the stop in the transducer's internal thread and then unscrew by a full revolution.
- Additionally, with the Z4A/500kN: by turning the knuckle eye, bring the holes of the sleeve and the slots of the knuckle eye to the cover. Screws can then be attached to form a twist-proof fixing.

Knuckle eyes **ZGW/ZGUW** for TOP–Z30



Knuckle eye **ZGOW/ZGUW** for TOP–Z4A



Type	Upper/lower knuckle eye Order number	a	f	W	∅B
TOP–Z30/100N – 1000N	1–U1R/200kg/ZGW	147.5	170	12	8^{H7}
TOP–Z30/2kN – 10kN	1–U2A/1t/ZGUW	169	201	16	12^{H7}

Type	upper knuckle eye lower knuckle eye	Weight (kg)	a approx.		f approx.		W	∅ B	M_A (Nm)
			min	max	min	max			
TOP-Z4A/20 kN	1–Z4/20kN/ ZGOW 1–Z4/20kN/ ZGUW	0,2	158	170	198	210	21	16^{H7}	120
TOP-Z4A/50 kN	1–U2A/2t/ZGOW 1–U2A/2t/ZGUW	0,8 0,4	190	199	245	254	25	20^{H7}	350
TOP-Z4A/100 kN	1–Z4/100kN/ ZGOW 1–Z4/100kN/ ZGUW	1,1	261	269	331	339	37	30^{H7}	950
TOP-Z4A/200 kN	1–U2A/10t/ ZGOW 1–U2A/10t/ ZGUW	3,2 1,1	352	357	475	480	35	$50\ ^{+0,001}_{-0,014}$	2000[1)]
TOP-Z4A/500 kN	1–Z4/500kN/ ZGOW 1–Z4/500kN/ ZGUW	17,3 12,0	570	590	764	784	44	$60\ ^{+0,003}_{-0,018}$	4000[2)]

1) Secure the underside with two screws to stop it twisting; for the side of the pin with the external thread only

To install the transducers without play, they must be sufficiently prestressed and locked with the mounting accessories (knuckle eyes, tension bars or pressure bars).

The tightening torques M_A recommended in the table for the TOP–Z4A, must be conducted non-positively through the transducer and must not be exceeded.

When locking, make sure that the transducer signal changes by no more than 0.1%.

For transducers with nominal (rated) forces 100 N..200 kN, tensile loading can also be locked in the following way:

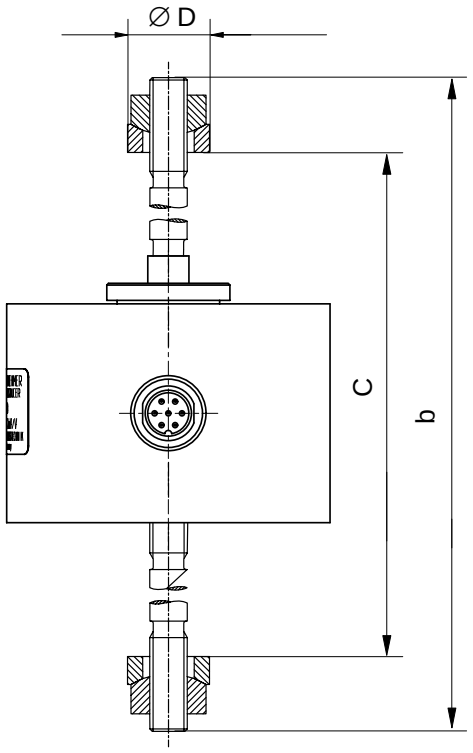
- screw in the thread of the knuckle eye until it reaches the stop in the transducer's internal thread and then unscrew by a full revolution.
- load transducer with 10..20% of the nominal force
- tighten the lock nut of the lower knuckle eye

NOTE

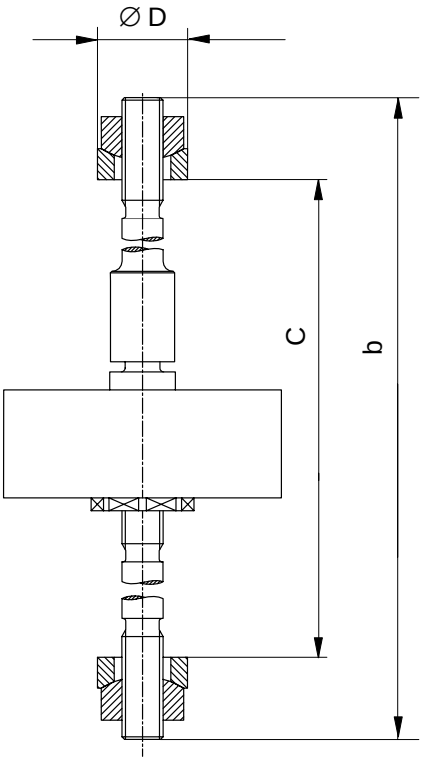
With the TOP–Z30, tighten first the nut on the base and then the upper nut; hold the TOP–Z30 by the flat of the nut.

Installation with force introduction piece ZKM according to EN10002–3 or ISO376

Tensile force introduction **ZKM** for TOP–Z30



ZKM tensile force introduction for TOP–Z4A



Type	ZKM Order number	b	C		∅D
			min	max	
TOP–Z30/2kN–10kN	1–Z30/10kN/ZKM	229	250	312	$35^{-0.120}_{-0.280}$

Type	ZKM accessories	Weight (kg)	B	C		∅ D
				min	max	
TOP–Z4A/20kN	Z4A/20kN/ZKM	0.82	325	228	276	$35^{-0.120}_{-0.280}$
TOP–Z4A/50kN	Z4A/50kN/ZKM	1.45	350	248	299	$45^{-0.130}_{-0.290}$
TOP–Z4A/100kN	Z4A/100kN/ZKM	2.32	395	277	334	$50^{-0.130}_{-0.290}$
TOP–Z4A/200kN	Z4A/200kN/ZKM	4.19	447	317	382	$64^{-0.170}_{-0.330}$
TOP–Z4A/500kN	Z4A/500kN/ZKM	20.1	623	432	522	$90^{-0.170}_{-0.390}$

Installation:

- Screw in the thread of force introduction piece ZKM until it reaches the stop in the transducer's internal thread and then unscrew by a full revolution.

6 Electrical connection

6.1 Instructions for cabling

- Always use shielded, low-capacity measurement cable (HBM cables meet these requirements).
- Do not lay measurement cable parallel to high-voltage power lines or control circuits. If this is not possible (e.g. in cable ducts) protect the measurement cable, e.g. with armoured steel tube and maintain a minimum distance of 50 cm from the other cables. High-voltage power lines and control lines should be twisted (15 turns per meter).
- Avoid stray fields of transformers, motors and contactors.
- Do not earth transducer, amplifier and display device more than once. All the devices in the measurement chain are to be connected to the same earthed conductor.
- The screen of the connection cable is connected to the transducer housing.

6.2 Wiring pin assignment

TOP–Z30

Two 7-pin male device connectors are located on the enclosure (male connectors, Series 723). To avoid creating force bypasses through the cable, you can use either the lower or the lateral connector, depending on the configuration.

If the transducer is connected according to the following connection diagram then when the transducer has compressive loading the output voltage at the measuring amplifier is positive.

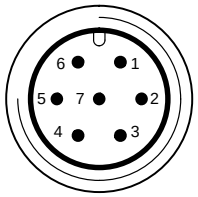
	Pin Male connector	Assignment	Wire colour
Top view  **Male connector, series 723**	1	Measurement signal (+)	WH
	2	Excitation voltage (–)	BK
	3	Excitation voltage (+)	BU
	4	Measurement signal (–)	RD
	5	No function	–
	6	Sensor circuit (+)	GN
	7	Sensor circuit (–)	GY

Fig. 6.1: Male connector, series 723 (screwed)

TOP–Z4A

The 3m long transducer connection cable has color-coded free wire ends. The cable shielding is connected in accordance with the Greenline concept. This means that the measurement system is surrounded by a Faraday cage. Electromagnetic interference will not affect the measurement system.

Connectors to CE standard are to be fitted at the free end of the transducer.

If connectors are fitted, the shielding must have a plane contact area.

If a different connection technique is used then good EMC shielding is to be provided in the wiring loom, the shielding again being laid over the full area (see also HBM Greenline Information, document G36.35.0).

If the transducer is connected according to the following connection diagram then when the transducer has compressive loading the output voltage at the measuring amplifier is positive.

Six-wire connection

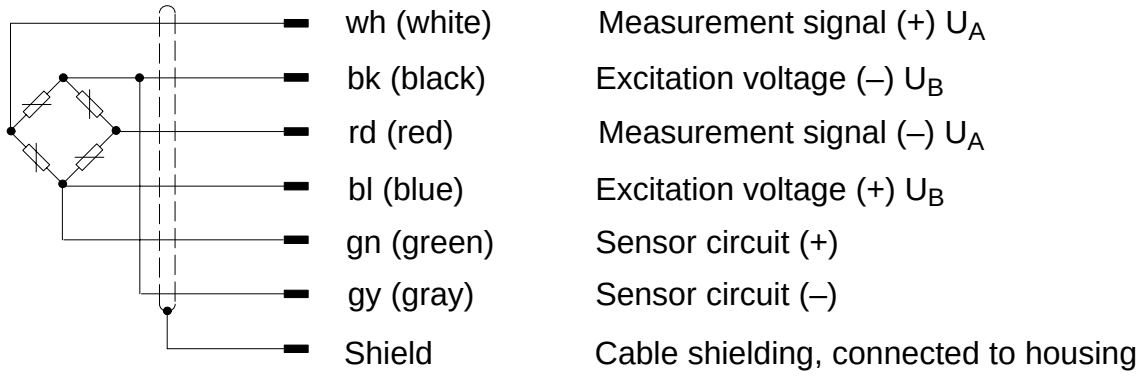


Fig. 6.2: Pin assignment of TOP–Z4A

7 Specifications

Type			TOP-Z30		TOP-Z4A	
Data according to VDI standards 2638						
Nominal force	F_{nom}	kN	0.1 – 1	2 – 10	20 – 50	100 – 500
Nominal sensitivity	C_{nom}	mV/V	2		2	
rel. sensitivity deviation	d_c	%	0.1		0.1	
rel. tensile/compressive force sensitivity difference	d_{zd}	%	0.1		0.2	
Zero signal tolerance	$d_{s,o}$	mV/V	0.1		0.01	
rel. zero point compensation (zero signal return)[1]	f_o	%	0.004		0.004	
Rel. range (0.2F_{nom} to F_{nom}) at:[1]						
unchanged mounting position	b_i	%	0.002		0.003	
different mounting positions	b					
Compressive force		%	0.005		0.008	
Tensile force		%	0.01		0.016	
Rel. range of inversion (0.2F_{nom} to F_{nom})[1]	u	%	0.03		0.03[3]	
Cubic interpolation error (0.2F_{nom} to F_{nom})[1]	f_c	%	0.002		0.002	
Effect of temperature/10K by reference to nominal sensitivity						
on sensitivity	TK_c	%	0.015	0.01	0.01	
on zero signal	TK_0	%	0.015	0.01	0.015	
Effect of transverse forces (transverse forces 10% F_{nom})[2]	d_Q	%	0.1		0.03	
Effect of eccentricity per mm	d_E	%	0.005		0.01	0.005
Rel. creep over 20 min	d_{crF+E}	%	0.01		0.01	
Input resistance	R_e	Ω	>345	>690	>345	
Output resistance	R_a	Ω	300–500	600–800	356 ± 0.3	
Isolation resistance	R_{is}	Ω	$>5 \cdot 10^9$		$>5 \cdot 10^9$	
Reference excitation voltage	U_{ref}	V	5		5	
Operating range of the excitation voltage	$B_{U,G}$	V	0.5 ... 12		0.5 ... 12	
Nominal temperature range	$B_{t,nom}$	°C	+17...+27			
Operating temperature range	$B_{t,G}$	°C	0...+40			
Storage temperature range	$B_{t,S}$	°C	-10...+70			
Reference temperature	t_{ref}	°C	+22			

1) Specifications to EN10002–3 or ISO376

2) applies in the case of the TOP-Z4A half pin height

3) in the case of tensile force TOP–Z4A/500 kN: 0.07%

Type			**TOP-Z30**		**TOP-Z4A**	
Max. operational force	(F_G)	%	120	150	150	
Limit force	(F_L)	%	150		150	
Breaking force	(F_B)	%	250		250	
Static lateral limit force	(F_Q)	%	60		30	
Rel. permissible vibrational stress	F_{rb}	%	70		70	50
Plug connection			Radial and axial enclosure connector (male) Binder Co. Series 723		–	
Cable length, six-wire connection		m	–		6	
Degree of protection to DIN EN 60529			IP50		IP 67	

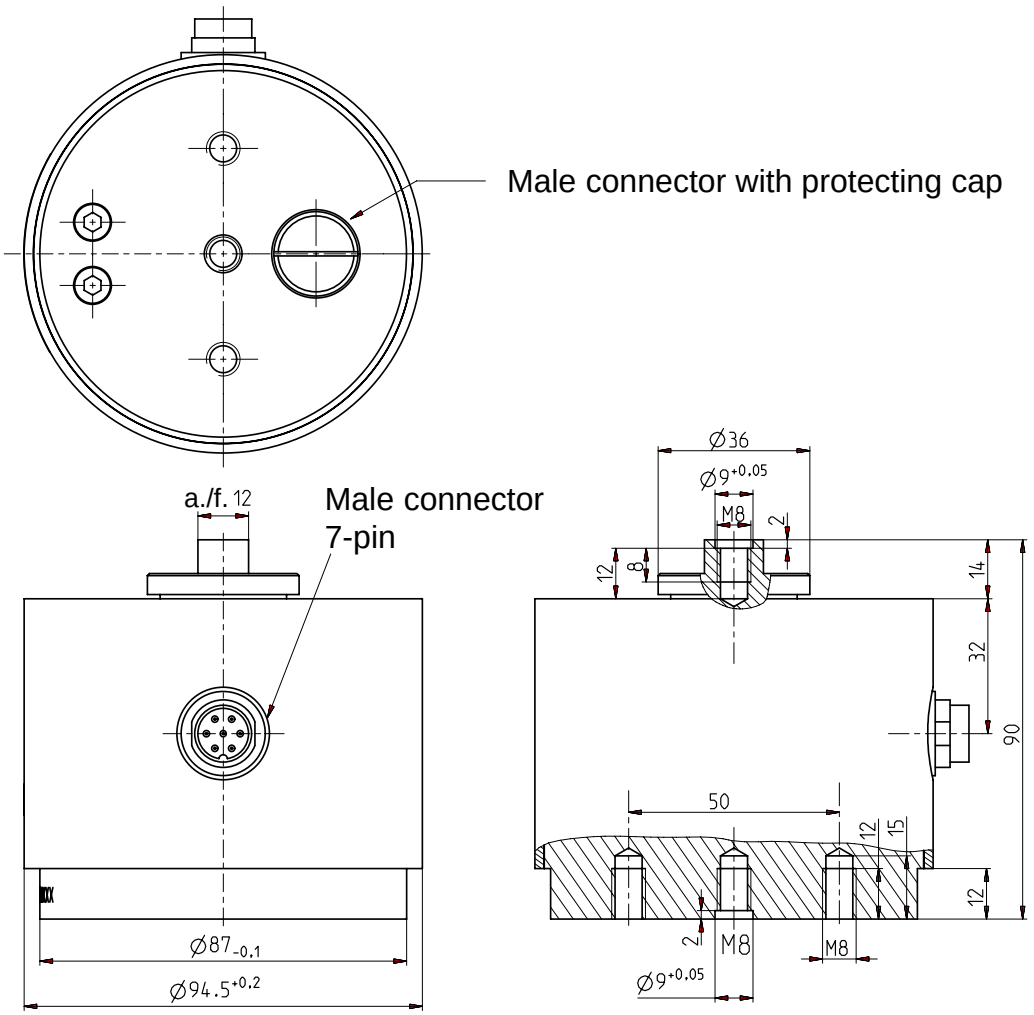
Type			TOP-Z30							TOP-Z4A				
Nominal force	**F_{nom}**	**kN**	**0.1**	**0.2**	**0.5**	**1**	**2**	**5**	**10**	**20**	**50**	**100**	**200**	**500**
Limit torque	M_G	Nm	3	5			80			120	350	950	2000	4000
Nominal displacement	S_{nom}	mm	< 0.4				approx. 0.2			0.2		0.25	0.28	0.45
Fundamental resonance frequency	f_G	kHz	0.3	0.5	0.9	1.1	1.1		1.25	4.1	4.5	3.4	3.6	2.5
Weight		kg	approx. 0.9				approx. 2.3			1.8	2.4	5.5	11.2	42

TOP Transfer force transducers are available only in connection with a DKD calibration to EN 10002–3 or ISO 0376.

Order no.: K–CAL–FD...

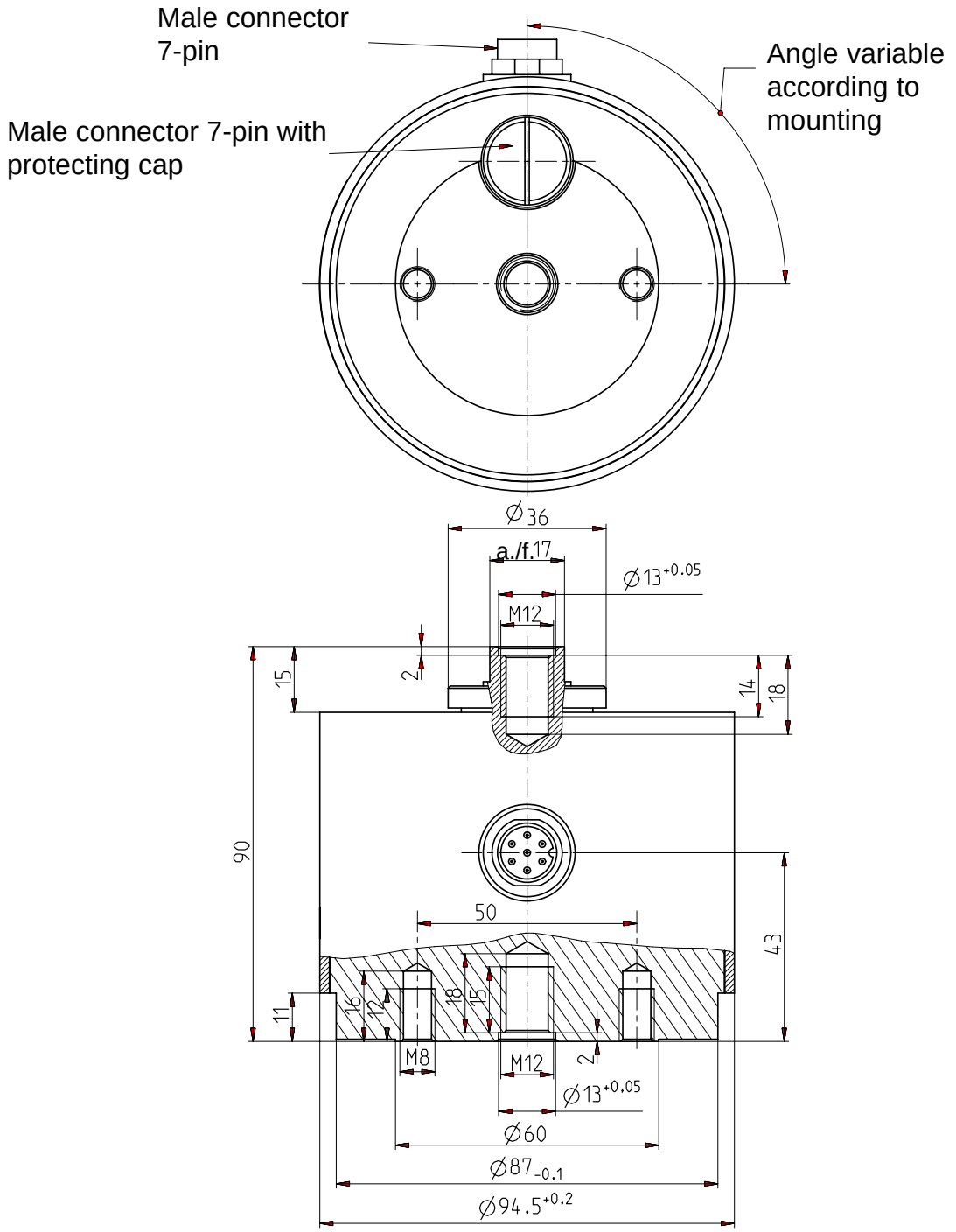
8 TOP Transfer dimensions

TOP–Z30
100 N – 1000 N



TOP–Z30

2 kN – 10 kN

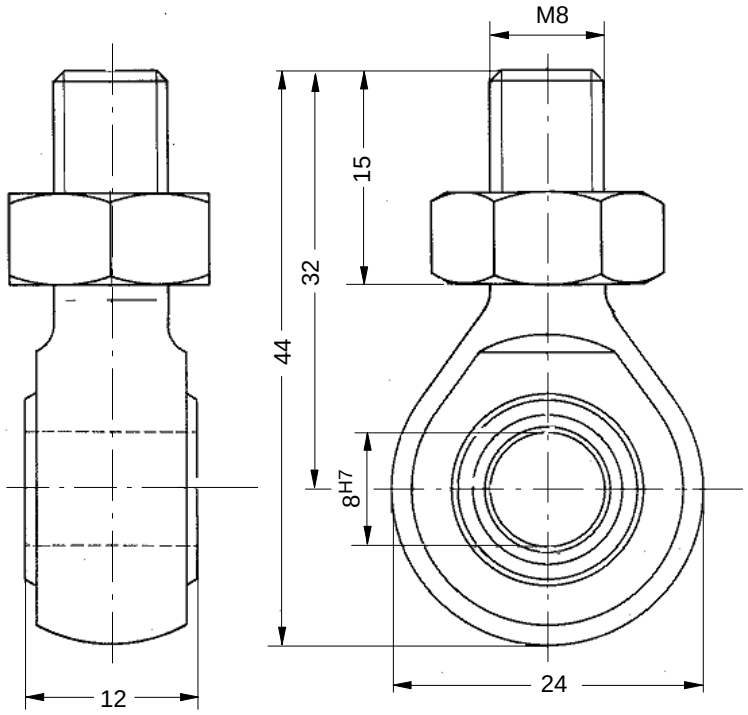


Accessories for TOP-Z30:

Knuckle eye ZGOW for nominal load 100 N to 1000 N

Type U1R/200kg/ZGW

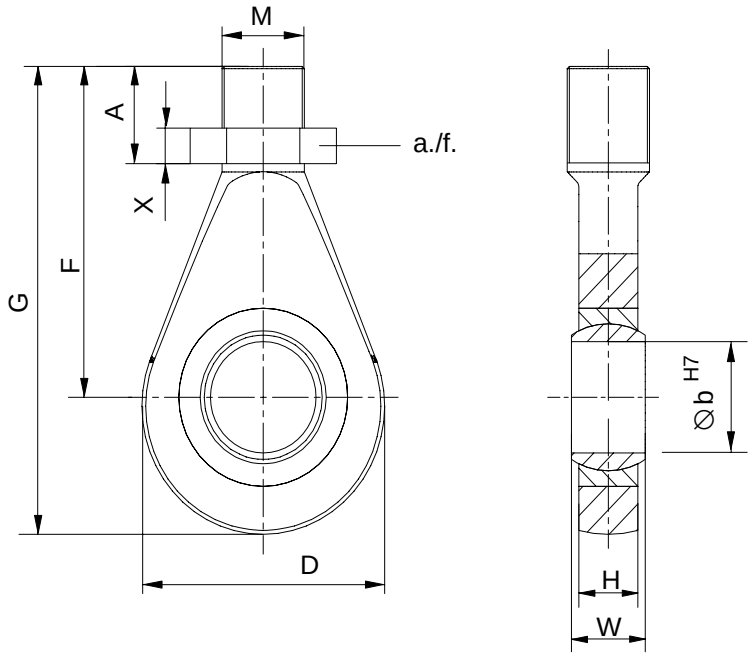
Lock nuts included in the scope of supply



Accessories for TOP-Z30:

Knuckle eye ZGUW for nominal load 2 kN to 10 kN

Type U2A/1t/ZGUW

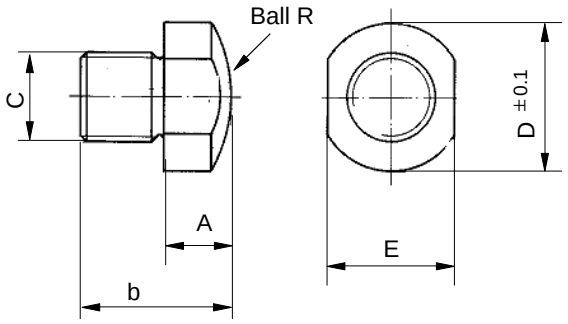


Material: quenched and tempered steel, galvanized; anti-friction bearing steel and PTFE/bronze fabric foil

Nominal force	A	∅B H7	D	F	G	H	M	X	W	a./f.	Weight (kg)
2kN... 10kN	33.5	12	32	54.5	70.5	12	M12	7	16	19	0.1

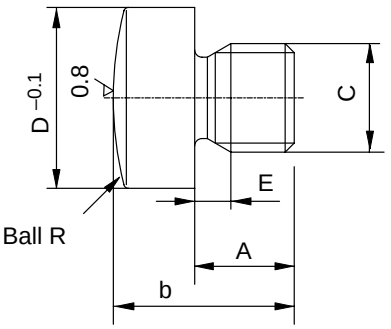
Load button for compressive loading

nominal load 100 N – 1 kN



Type U1R/200kg/ZL

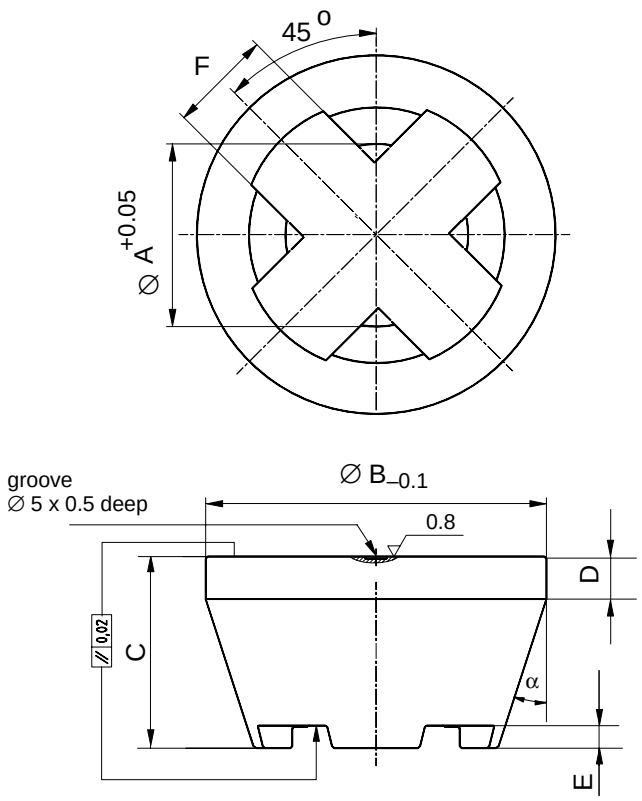
nominal load 2 kN – 10 kN



Nominal force	A	b	C	D	E	R
100 N ... 1 kN	8	15	M8	13	11	16
2kN... 10kN	11	20	M12	20	4	40

Accessories for TOP–Z30

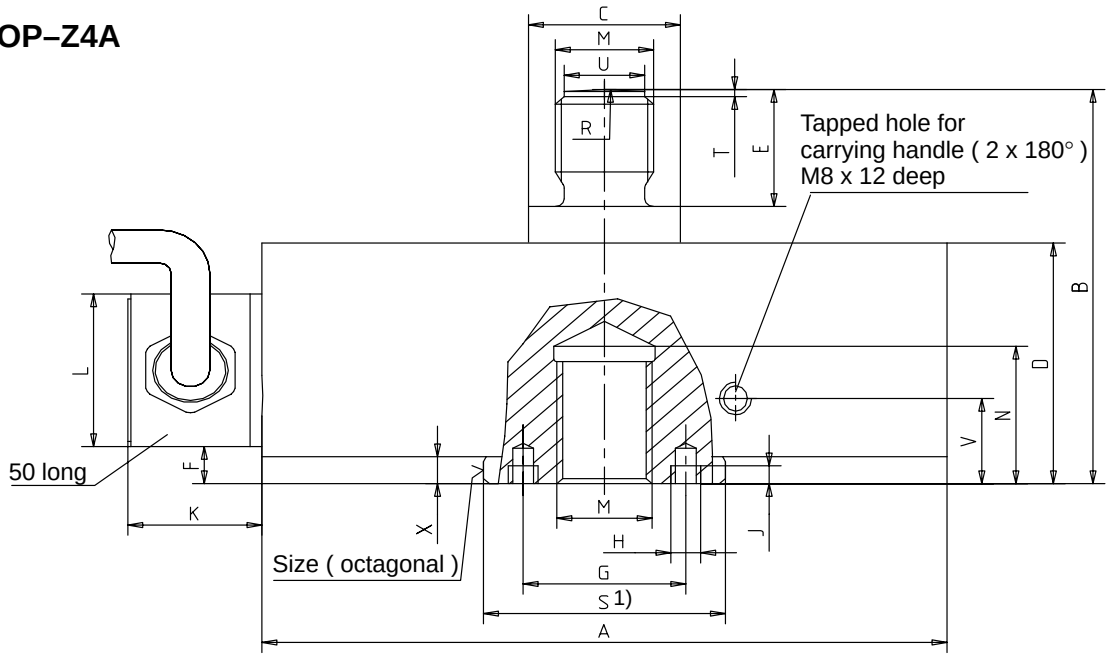
EDO4 thrust piece according to DIN EN10002-3 or ISO376



Type	Thrust piece	Weight (kg)	∅ A	∅ B	C	D	E	F	α
TOP-Z30/ 100 N...1 kN	EDO3/1 kN	approx. 0.2	13.2	37	22	6	3	8	18°
TOP-Z30/ 2 kN...10 kN	EDO4/50 kN	0.34	20.2	48	29	8	5	12	18°

Tensile force introductions ZKM according to DIN EN10002–3 or ISO376 see page 17.

TOP–Z4A



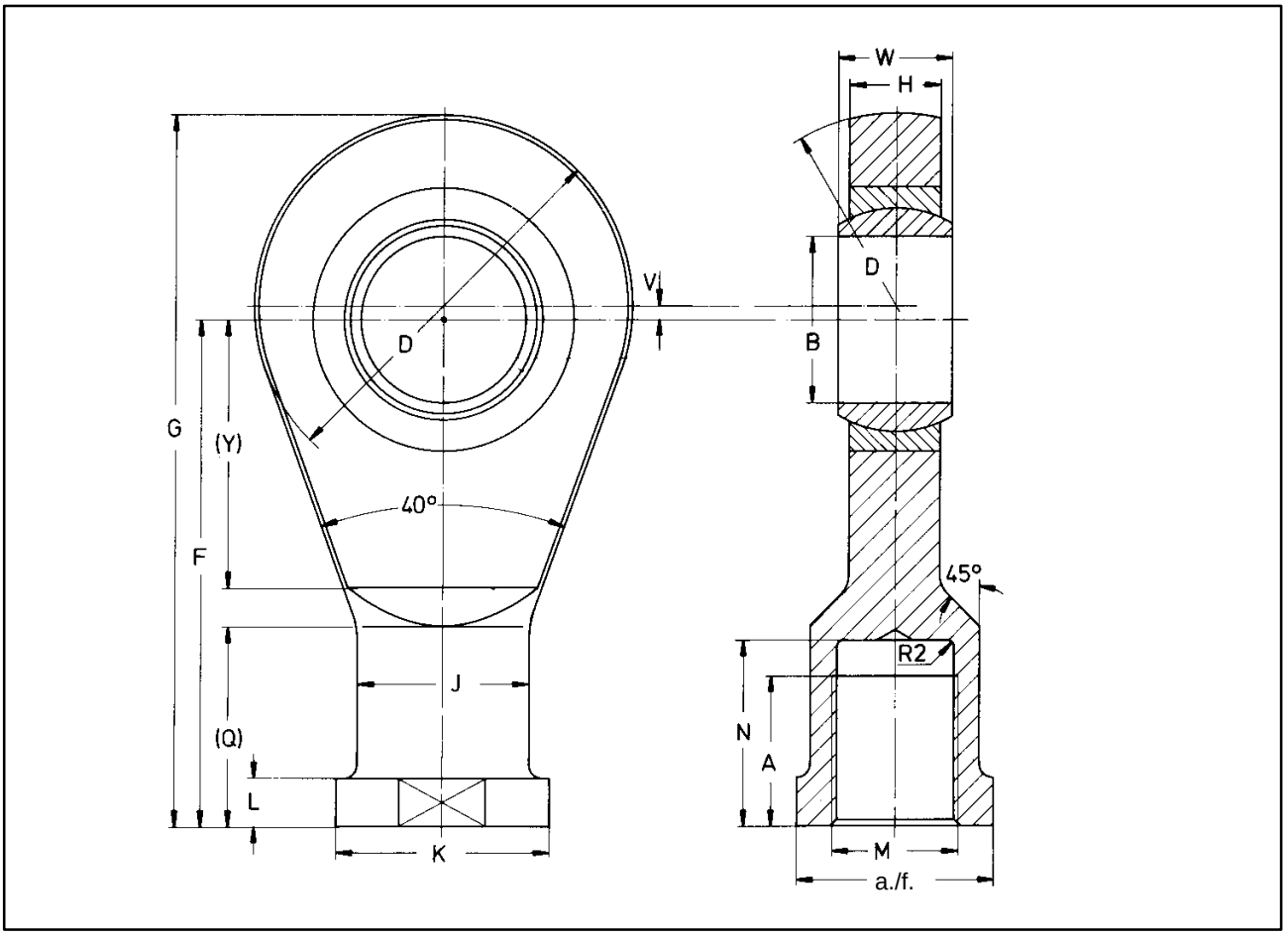
1) Fit for centering

Type	∅ A	B	∅ C_{f7}	D	E	F	G	H	J	M
TOP–Z4A/20 kN	115	77	25	47	23	7.3	–	–	–	M16
TOP–Z4A/50 kN	120	83	26	55	23	10.2				M20x1.5
TOP–Z4A/100 kN	146	107	40	69	33	12.2				M30x2
TOP–Z4A/200 kN	180	137	50	89	43	13.1	68	M6	6	M39x2
TOP–Z4A/500 kN	275	250	100	145	95	21	118	M8	8	M72x4

Type	N	R	∅ S_{f7}	T	∅ U	V	X	Size	K	L
TOP–Z4A/20 kN	27	60	40	1.4	13	–	5.3	38	22	30
TOP–Z4A/50 kN	28	60	48	1.4	17		8.2	45		
TOP–Z4A/100 kN	37	160	62	1.4	27		10.2	59		
TOP–Z4A/200 kN	45	160	76	1.8	36		11.1	73		
TOP–Z4A/500 kN	87	400	140	3	65	35	20	134	32	43

Accessories for TOP–Z4A:

ZGOW for all nominal loads (20kN, 50kN, 100kN, 200kN, 500kN)

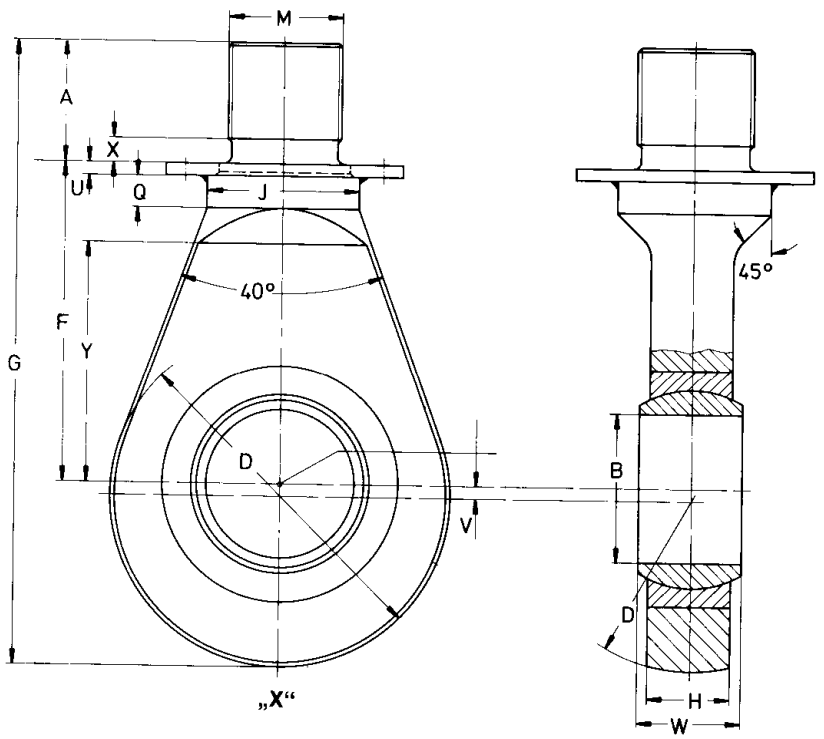


Nominal force in kN	Order no. ZGUW knuckle eye	Weight in kg	A	∅ B	∅ D	F	G	H	∅ J
20	Z4/20kN/ZGOW	0.2	28	16 ^{H7}	42	64	85	15	22
50	U2A/2//ZGOW	0.8	33	20 ^{H7}	50	77	102	18	27.5
100	Z4/100kN/ZGOW	1.1	51	30 ^{H7}	70	110	145	25	40
200	U2A/10T/ZGOW	3.2	115	50 $^{+0.002}_{-0.014}$	115	151	212.5	28	52
500	Z4/500kN/ZGOW	17.3	180	60 $^{+0.003}_{-0.018}$	180	240	337	36	100

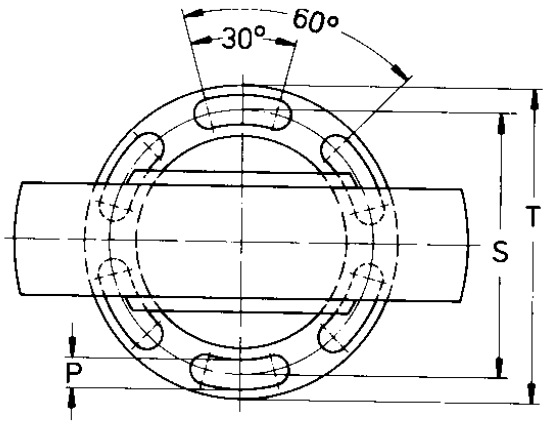
Nominal force in kN	∅ K	L	M	N	Q	a./f.	V	W	Y
20	27	8	M16	–	–	22	–	21	20
50	34	10	M20x1.5	–	–	32	–	25	24
100	50	15	M30x2	–	–	41	–	37	31
200	65	15	M39x2	56	60	60	4	35	78
500	128	20	M72x4	107	120	110	7	44	88

Accessories for TOP–Z4A:

ZGUW knuckle eye for nominal load 500kN



View “X”

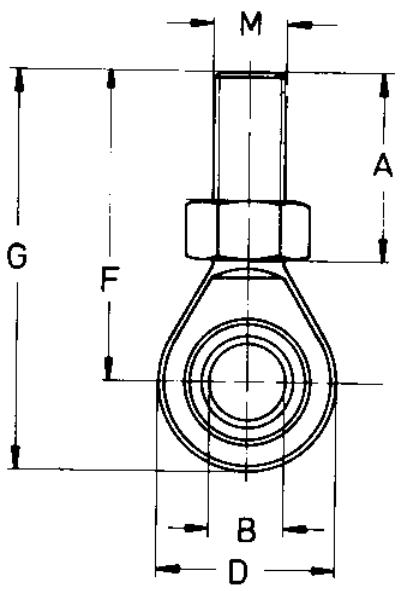


Nominal force in kN	Order no. ZGUW knuckle eye	Weight in kg	A	∅ B	D	F	G	H	M	∅ J
500	Z4/500kN/ZGUW	12	80	$60^{+0.003}_{-0.008}$	180	175	352	36	M72x4	80

Nominal force in kN	P	Q	∅ S	∅ T	U	V	W	X	Y
500	10	24	110	130	4	7	44	10	129

Accessories for TOP–Z4A:

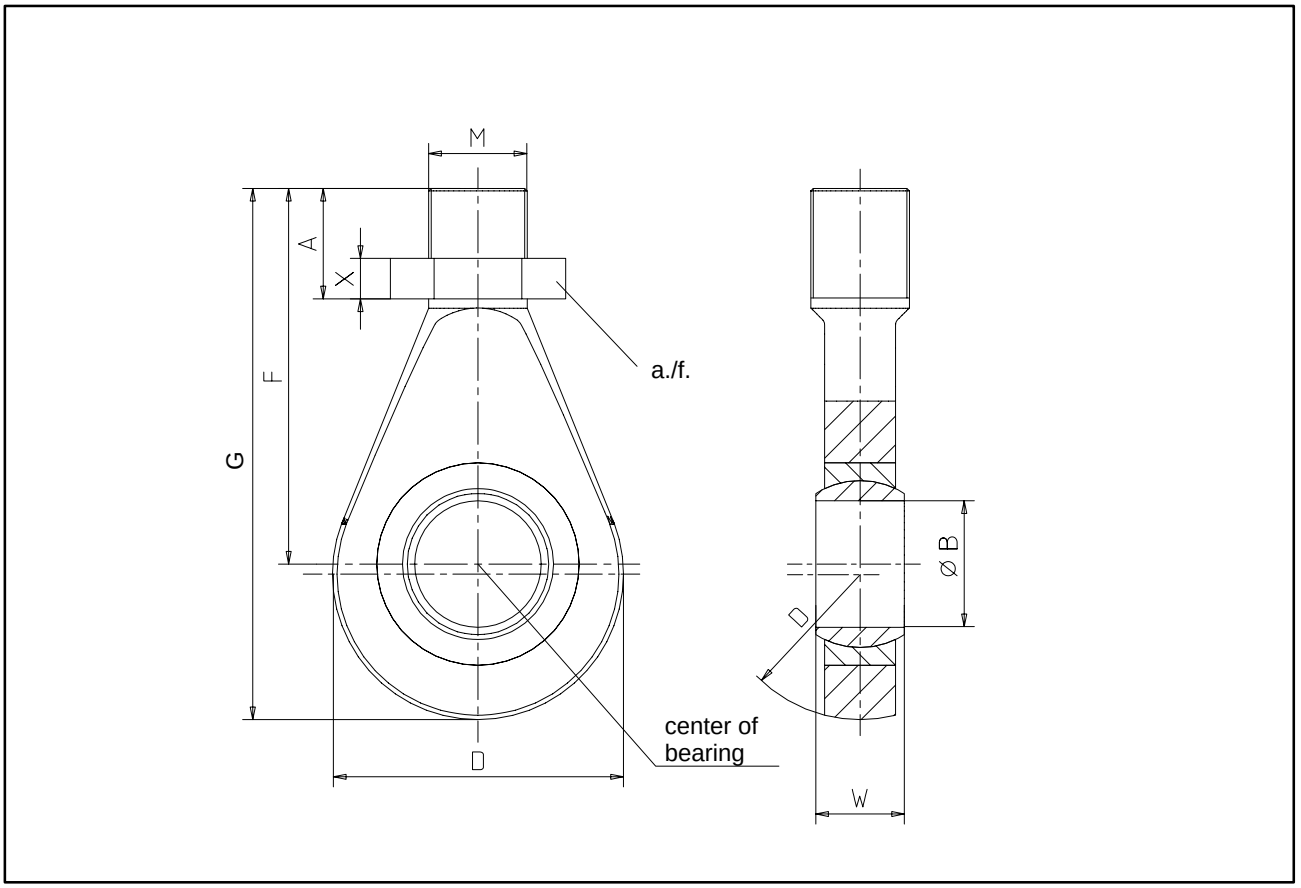
ZGUW knuckle eye for nominal load 20kN and 100kN



Nominal force in kN	Order no. ZGUW knuckle eye	Weight in kg	A	∅ B	∅ D	F	G	M
20	Z4/20kN/ZGUW	0.2	41.7	16 ^{H7}	42	67.7	88.7	M16
100	Z4/100kN/ZGUW	1.1	66.5	30 ^{H7}	70	110.5	145.5	M30x2

Accessories for TOP–Z4A:

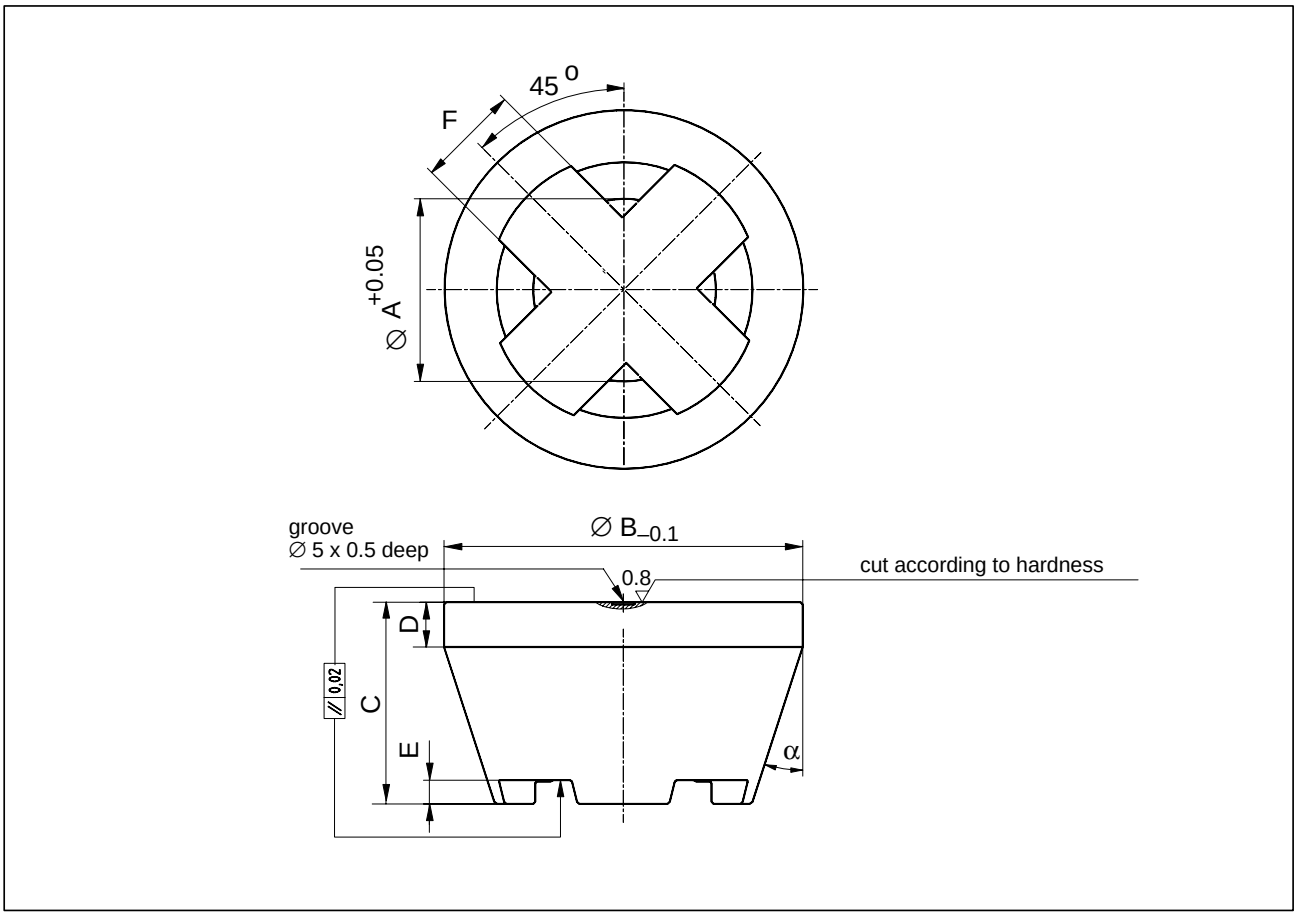
ZGUW knuckle eye for nominal load 50kN and 200kN



Nominal force in kN	Order no. ZGUW knuckle eye	Weight in kg	A	∅B	D	F	G	M	a./f.	W	X
50	1-U2A/2t/ ZGUW	0.4	57.5	25^{H7}	60	94.5	124.5	M24x2	36	31	10
200	1-U2A/10t/ ZGUW	3.2	80	$60^{+0.003}_{-0.018}$	126	168	236	M48x2	75	44	18

Accessories for TOP–Z4A

EDO4 thrust piece according to DIN EN10002-3 or ISO/FDIS 376



Type	Thrust piece	Weight (kg)	∅ A	∅ B	C	D	E	F	α
TOP-Z4A/20kN	1–EDO4/20kN	0.34	16.2	48	29	8	5	12	18°
TOP-Z4A/50kN	1–EDO4/50kN		20.2		29		5		
TOP-Z4A/100kN	1–EDO4/100kN	1.58	30.2	80	45	10	5	23	
TOP-Z4A/200kN	1–EDO4/200kN		39.2						
TOP-Z4A/500kN	1–EDO4/500kN	4.35	72.4	112	68	15	12	30	15°

Tensile force introductions ZKM according to DIN EN10002–3 or ISO376 see page 17.

9 Declaration of conformity

TOP–Z4A

Hottinger Baldwin Messtechnik GmbH
Im Tiefen See 45 - D-64293 Darmstadt
Tel. ++49/6151/803-0, Fax. ++49/6151/894896

Konformitätserklärung ***Declaration of Conformity*** ***Déclaration de Conformité***

Document: *213/11.2002*

Wir, / We, / Nous,

Hottinger Baldwin Messtechnik GmbH, Darmstadt

erklären in alleiniger Verantwortung, dass das Produkt / declare under our sole responsibility that the product / déclarons sous notre seule responsabilité que le produit

Kraft-Transfernormal

TOP-Z4A

auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder normativen Dokument(en) übereinstimmt (siehe Seite 2) gemäß den Bestimmungen der Richtlinie(n) / to which this declaration relates is in conformity with the following standard(s) or other normative document(s) (see page 2) following the provisions of Directive(s) / auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou autre(s) document(s) normatif(s) (voir page 2) conformément aux dispositions de(s) Directive(s)

89/336/EWG - Richtlinie des Rates vom 3. Mai 1989 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit, geändert durch 91/263/EWG, 92/31/EWG, 93/68/EWG und 93/97/EWG

Die Absicherung aller produktspezifischen Qualitätsmerkmale erfolgt auf Basis eines von der DQS (Deutsche Gesellschaft zur Zertifizierung von Managementsystemen) seit 1986 zertifizierten Qualitätsmanagementsystems nach DIN ISO 9001 (Reg. Nr. DQS-000001). Die Überprüfung der sicherheitsrelevanten Merkmale (Elektromagnetische Verträglichkeit, Sicherheit elektrischer Betriebsmittel) führt ein von der DATech erstmals 1991 akkreditiertes Prüflaboratorium (Reg. Nr. DAT-P-006 und DAT-P-012) unabhängig im Hause HBM durch.

All product-related features are secured by a quality system in accordance with DIN ISO 9001, certified by DQS (Deutsche Gesellschaft zur Zertifizierung von Managementsystemen) since 1986 (Reg. No. DQS-000001). The safety-relevant features (electromagnetic compatibility, safety of electrical apparatus) are verified at HBM by an independent testing laboratory which has been accredited by DATech in 1991 for the first time (Reg. Nos. DAT-P-006 and DAT-P-012).

Chez HBM, la détermination de tous les critères de qualité relatifs à un produit spécifique est faite sur la base d´un protocole DQS (Deutsche Gesellschaft zur Zertifizierung von Managementsystemen) certifiant, depuis 1986, notre système d´assurance qualité selon DIN ISO 9001 (Reg. Nr. DQS-000001).
De même, tous les critères de protection électrique et de compatibilité électromagnétique sont certifiés par un laboratoire d´essais indépendant et accrédité depuis 1991 (Reg. Nr. DAT-P-006 et DAT-P-012).

Darmstadt, 2002-11-01

Dr. Michael Altwein *H. Fritz*

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Document: ***213/11.2002***

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

This declaration certifies conformity with the Directives listed above, but is no asseveration of characteristics.
Safety directions of the delivered product documentation have to be followed.

Cette déclaration atteste la conformité avec les directives citées mais n´assure pas un certain charactère.
S.v.p. observez les indications de sécurité de la documentation du produit ajoutée.

Folgende Normen werden zum Nachweis der Übereinstimmung mit den Vorschriften der Richtlinie(n) eingehalten:

The following standards are fulfilled as proof of conformity with the provisions of the Directive(s):

Pour la démonstration de la conformité aux disposition de(s) Directive(s) le produit satisfait les normes:

EN 61326 : **1997**
+A1:1998 + A2:2001

Elektrische Betriebsmittel für Leittechnik und Laboreinsatz - EMV-Anforderungen; Deutsche Fassung

Typen:

TOP-Z4A/20kN, TOP-Z4A/50kN, TOP-Z4A/100kN, TOP-Z4A/200N, TOP-Z4A/500kN

TOP–Z30

HBM Hottinger Baldwin Messtechnik GmbH
Im Tiefen See 45 - D-64293 Darmstadt
Tel. ++49/6151/803-0, Fax. ++49/6151/894896

Konformitätserklärung *Declaration of Conformity* *Déclaration de Conformité*

Document: *214/11.2002*

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Hottinger Baldwin Messtechnik GmbH, Darmstadt

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declare under our sole responsibility that the product

déclarons sous notre seule responsabilité que le produit

Kraft-Transfernormal

TOP-Z30

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to which this declaration relates is in conformity with the following standard(s) or other normative document(s) (see page 2) following the provisions of Directive(s)

auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou autre(s) document(s) normatif(s) (voir page 2) conformément aux dispositions de(s) Directive(s)

89/336/EWG - Richtlinie des Rates vom 3. Mai 1989 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit, geändert durch 91/263/EWG, 92/31/EWG, 93/68/EWG und 93/97/EWG

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Chez HBM, la détermination de tous les critères de qualité relatifs à un produit spécifique est faite sur la base d´un protocole DQS (Deutsche Gesellschaft zur Zertifizierung von Managementsystemen) certifiant, depuis 1986, notre système d´assurance qualité selon DIN ISO 9001 (Reg. Nr. DQS-000001).
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Darmstadt, 2002-11-01

Dr. Michael Altwein *H. Fritz*

QV1051A1.05

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Document: *214/11.2002*

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EN 61326 **: 1997**
+A1:1998 + A2:2001

Elektrische Betriebsmittel für Leittechnik und Laboreinsatz - EMV-Anforderungen; Deutsche Fassung

Typen:

TOP-Z30/100N, TOP-Z30/200N, TOP-Z30/500N, TOP-Z30/1000N, TOP-Z30/2kN, TOP-Z30/5kN, TOP-Z30/10kN

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