HOTTINGER BALDWIN MESSTECHNIK
HBM Mess- und Systemtechnik GmbH

Mounting Instructions

Force Transducer with S.G Measurement System

Z4A, Z4A-G

B 20.Z4A.20 en

Contents page

Safety instructions

Use in accordance with the regulations

Force transducers of types Z4A and Z4A-G are used for high-precision force measurements and for force reference measurements (transfer standard). 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 Z4A, Z4A-G force transducer corresponds 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 minimise residual dangers. Prevailing regulations must be complied with at all times. There must be reference to the residual 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: **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

The Z4A, Z4A-G force transducer is 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

- Z4A force transducer or
- Z4A-G force transducer[1)] including DKD certificate[2)] (class 00 / class 05 for measuring range 500kN under DIN EN 10002-3 or ISO / FDIS 376)
- Z4A, Z4A-G Operating Manual

1) Z4A-G is only available from HBM in conjunction with a DKD calibration according to EN10002-3.

2) The calibration certificate must be ordered separately (see accessories).

Accessories (not included in the scope of supply)

- DKD calibration certificate according to EN10002-3 order no. K-CAL-FD

- ZKM tensile force introduction

  for 20kN: 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

- ZDK compressive force introduction
  (recommended for standard measurements in industry)

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

- 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

- EDO4 thrust piece
  (recommended for precision measurements, for example EN10002-3 calibrations)

EDO4/20kN	Order no.	3-9219.0718
EDO4/50kN	Order no.	3-9219.0719
EDO4/100kN	Order no.	3-9219.0720
EDO4/200kN	Order no.	3-9219.0721
EDO4/500kN	Order no.	3-9219.0722

2 Application information

Z4A force transducer:

Precision force transducers of the Z4A type series measure tensile forces and compressive forces.

They measure static and quasi-static forces with great accuracy and reproducibility and therefore require judicious handling. You must take particular care when transporting and installing the devices. If you knock or drop the transducers, this could permanently damage them.

Z4A-G force transducer with DKD certificate from HBM:

Force transducer calibrated with guaranteed class 00 (20kN – 200kN) and 05 (500kN) according to DIN EN10002-3 or ISO / FDIS 376.

The transducers are calibrated as standard **in the tensile force direction.** On request, however, they can also be calibrated in the compressive force direction, under the DKD.

The limits for the permissible mechanical, thermal and electrical stresses are stated in the Specifications. Be sure to allow for them when planning the measuring setup, when installing and lastly, when operating.

3 Structure and mode of operation

3.1 Measuring body

The measuring body comprises a system of measuring springs with 8 applied strain gauges (S.G.). The strain gauges are arranged so that four of them are extended and the other four are upset when a force acts on the transducer.

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

3.2 Housing

The enclosure with the integrated system of measuring springs is hermetically sealed at the top and at the bottom by metal membranes, so that moisture cannot damage the sensitive application.

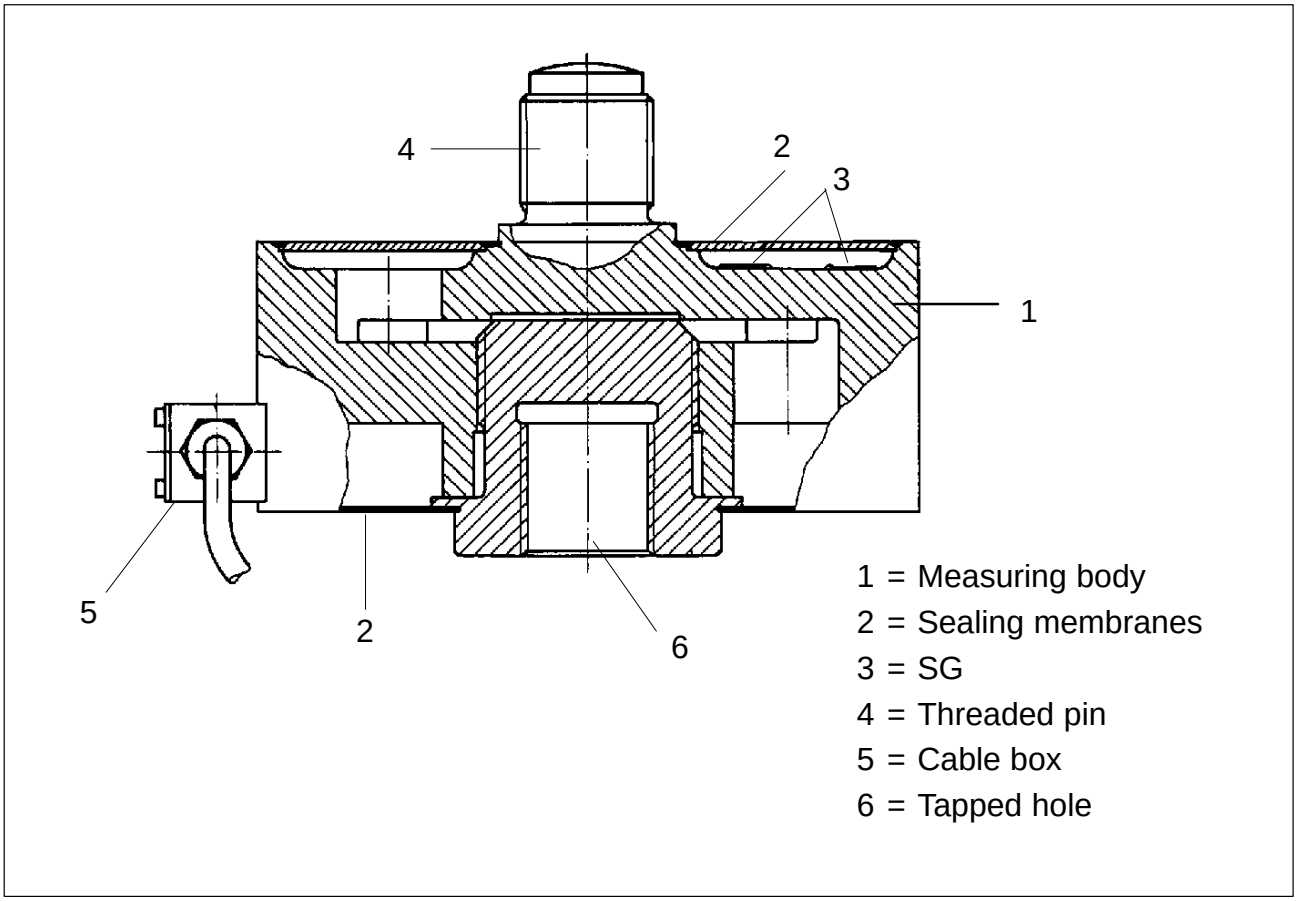


Fig.3.1 Z4A, Z4A-G (20kN...500kN)

3.3 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).

The effects of temperature on the zero signal (S/G bridge and housing) and on the sensitivity are compensated.

Changes in the ambient pressure act as additive (subtractive) forces. These are scarcely of importance when compared with large nominal loads.

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 heating (for example radiant heat) or cooling on one side. A radiation shield and all-round heat insulation bring about marked improvements. They must not form a force shunt.

4.2 Moisture

Extreme humidity or a tropical climate should be avoided if this means that the classified limit values are exceeded (degree of protection IP67 under DIN EN 60529).

4.3 Air pressure

Changes in air pressure affect the force transducer in the same way as a change in force. In the case of normal changes in ambient pressure ±20mbar, however, the effect on the measurement signal is negligible (changes in air pressure of ±10mbar only have an effect on the zero signal of 6N for 20kN and 50kN transducers).

4.4 Chemical effects

The steel housing of the transducers is protected by a powder coating. If used in difficult environmental conditions (direct weather effects, contact with media which encourage corrosion) additional protective measures should be employed by the user. The unit can be painted with commercial protective paint or a tar-based coating (underseal). The sheath of the connection cable is made of silicon rubber.

The uncoated force introduction areas are greased to provide protection against corrosion.

5 Mechanical installation

5.1 Important measures for installation

– treat the transducer gently
– if measuring compressive forces, make sure there is a solid support structure
– the force-introduction surfaces must be scrupulously clean and carry in full
– keep to the depths of engagement for threaded rods or knuckle eyes
– do not overload the transducer.

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.

5.2 General installation guidelines

The measurement direction in which forces act on the transducer must be as precise as possible.

WARNING

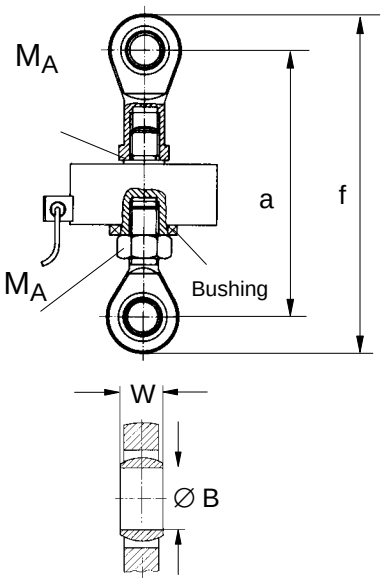
Torsion and bending moments, eccentric loading and transverse forces result in measurement errors and if limit values are exceeded, could destroy the transducer.

5.3 Mounting accessories for tensile loading/ compressive loading

Knuckle eyes are provided for Z4A installation. This 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. The knuckle eyes are intended primarily for **static tensile and compressive loading** of the transducer.

Installing knuckle eye, ZKM and threaded adapters:

- Screw the knuckle eye thread into the transducer's inside thread until it reaches the stop, then loosen it by one turn.
- With Z4A/500kN in addition: turn the knuckle eye to align the bushing holes with the knuckle eye apertures.



Type	upper knuckle eye lower knuckle eye	Weight (kg)	a	f	W	∅B	M_A (Nm)
Z4A/20 kN	Z4/20kN/ZGOW Z4/20kN/ZGUW	0.2	158	198	21	16^{H7}	120
Z4A/50 kN	U2A/2t/ZGOW U2A/2t/ZGUW	0.8 0.4	184	234	25	20^{H7}	350
Z4A/100 kN	Z4/100kN/ZGOW Z4/100kN/ZGUW	1.1	251	322	37	30^{H7}	950
Z4A/200 kN	U2A/10t/ZGOW U2A/10t/ZGUW	3.2 1.1	352	475	35	$50\ ^{+0.001}_{+0.014}$	2000
Z4A/500 kN	Z4/500kN/ZGOW Z4/500kN/ZGUW	17.3 12.0	570	764	44	$60\ ^{+0.003}_{+0.018}$	4000[1)]

1) underside secured with 2 screws to prevent rotation; for pin end with outside thread only

For **dynamic loading**, Z4A transducers must be installed without play. Knuckle eyes only have limited applicability for dynamic loading, as with dynamic alternating stress, the pivoting bearings increase their bearing clearance, thus falsifying the measured value. With the increased load cycle, there is a risk that the knuckle eyes could be destroyed. For this type of loading, we recommend using flexible tension bars or pressure bars.

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

Do not use less than the starting torques M_A recommended in the table overleaf, which should be routed through the transducer, in non-positive contact.

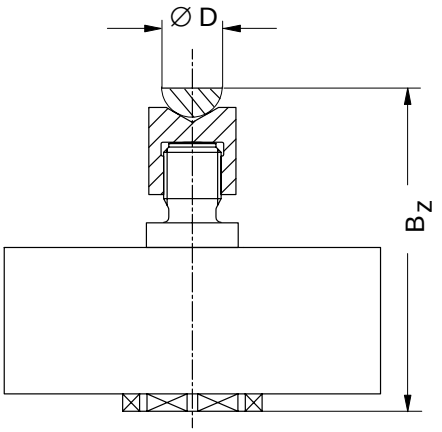
When locking, make sure that the transducer signal changes by no more than 0.1%.

In the case of transducers with nominal forces 20kN..100kN, you can also lock as follows for tensile loading:

- screw in knuckle eyes
- load transducer with 10..20% of the nominal force
- tighten the lock nut of the lower knuckle eye

Static loading can also – in addition to using knuckle eyes – be carried axially to the transducer through hardened (40...44HRc) pressure plates that have been given a plane-parallel surface. The transducer support structure must also have an inflexible, hardened and plane-parallel surface. We recommend ZDK compressive force introduction parts for *standard measurements* in industry.

ZDK compressive force introduction accessories

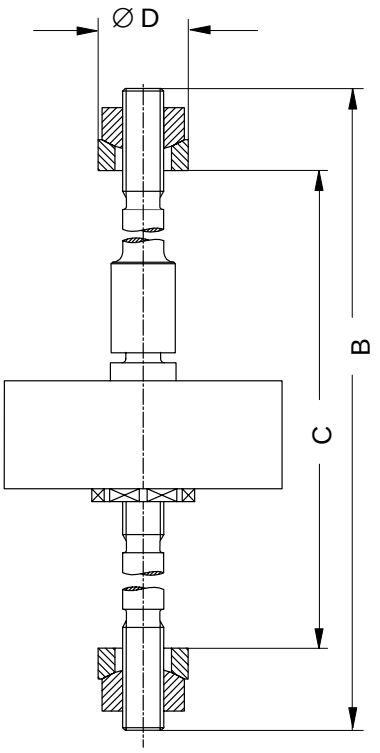


Type	ZDK accessories	Weight [kg]	B_Z	∅ D $^{-0.1}_{-0.3}$
Z4A/20kN	Z4A/20kN/ZDK	0.10	99	20
Z4A/50kN	Z4A/50kN/ZDK	0.18	111	25
Z4A/100kN	Z4A/100kN/ZDK	0.40	140	36
Z4A/200kN	Z4A/200kN/ZDK	1.26	200	50
Z4A/500kN	Z4A/500kN/ZDK	5.80	365	80

ZKM force introduction part for precision measurement, for example DIN EN10002-3-calibrations

For use as a transfer standard or control standard for the Z4A, Z4A-G force transducer, we recommend using ZKM force introduction parts according to DIN EN 10002-3 or ISO/FDIS376.

ZKM tensile force introduction accessories



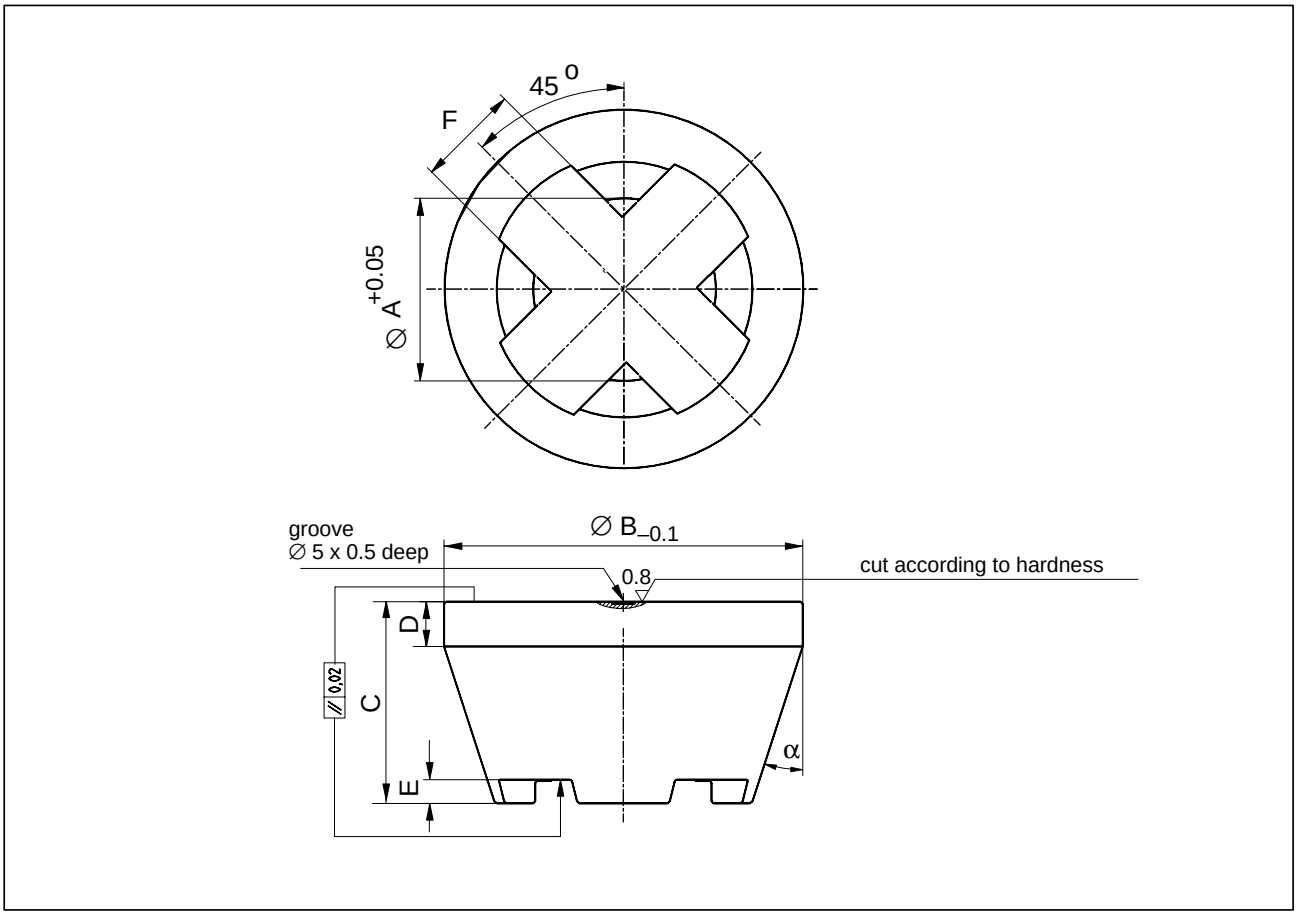
Dimensions apply to tensile force introduction

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

Installing:

- Screw the thread of the ZKM force introduction part into the transducer's inside thread until it reaches the stop, then loosen it by one turn.

EDO4 thrust piece for precision measurement, for example DIN EN10002-3 or ISO/FDIS 376 calibrations



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

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 metre).
- Avoid stray fields of transformers, motors and contactors.
- Do not earth transducer, amplifier and display device more than once. All the devices in the measuring 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

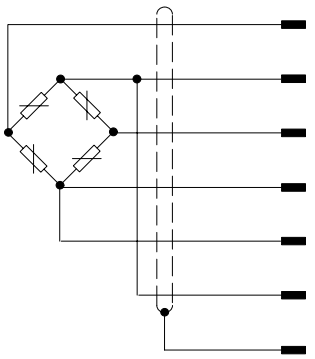
The 3m long transducer connection cable has colour-coded free wire ends. The cable shielding is connected in accordance with the Greenline concept. This means that the measurement system is surrounded by a Faraday cage. Electromagnetic interference will not affect the measurement system.

Connectors to CE standard are to be fitted at the free end of the transducer. **The shielding is here to be laid over the whole 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



WH (white)	Measurement signal (+) U_A
BK (black)	Excitation voltage (–) U_B
RD (red)	Measurement signal (–) U_A
BU (blue)	Excitation voltage (+) U_B
GN (green)	Sensor circuit (+)
GY (grey)	Sensor circuit (–)
YE (yellow)	Cable shielding, connected to housing

Fig. 6.1: Z4A, Z4A-G pin assignment

7 Specifications

Force transducer type	**Z4A / Z4A-G**						
Data according to VDI standards 2638							
Nominal force	F_{nom}	kN	20	50	100	200	500
Accuracy class			0.02				0.04
Nominal sensitivity	C_{nom}	mV/V	2				
rel. sensitivity deviation	d_c	%	0.1				
rel. tensile/compressive force sensitivity difference	d_{zd}	%	0.2				
Zero signal tolerance	$d_{s,o}$	%	0.5				
rel. zero point compensation (zero signal return)[1)]	f_o	%	$< \pm 0.025$				
Rel. range ($0.2F_{nom}$ to F_{nom}) at:[1)]							
unchanged mounting position, typically	b_{rg}	%	0.02				
different mounting positions, typically	b_{rv}	%	0.03				
Rel. range of inversion ($0.2F_{nom}$ to F_{nom})	u	%	0.1				0.3
Linearity deviation	d_{lin}	%	0.02				0.03
Effect of temperature on sensitivity/10K by reference to sensitivity	TK_c	%	0.01				
Effect of temperature on zero signal/10K by reference to sensitivity	TK_0	%	0.015				
Effect of transverse forces (transverse force 10% F_{nom})[2)]	d_Q	%	0.03				
Effect of eccentricity per mm	d_E	%	0.01		0.005		
Rel. creep over 15min	d_{crF+E}	%	0.02				
Input resistance	R_e	Ω	>345				
Output resistance	R_a	Ω	356 ± 0.3				
Isolation resistance	R_{is}	Ω	$>5 \cdot 10^9$				
Reference excitation voltage	U_{ref}	V	5				
Operating range of the excitation voltage	$B_{U,G}$	V	0.5 ... 12				
Nominal temperature range	$B_{t,nom}$	°C	+10...+40				
Operating temperature range	$B_{t,G}$	°C	-30...+85				
Storage temperature range	$B_{t,S}$	°C	-50...+85				
Reference temperature	t_{ref}	°C	+23				
Max. operational force	(F_G)	%	150				
Limit force	(F_L)	%	150				
Breaking force	(F_B)	%	250				
Static lateral limit force	(F_Q)	%	30				
Limit torque	M_G	Nm	120	350	950	2000	4000
Nominal displacement	S_{nom}	mm	0.2		0.25	0.28	0.45
Fundamental resonance frequency	f_G	kHz	4.1	4.5	3.4	3.6	2.5
Weight		kg	1.8	2.4	5.5	11.2	42
Rel. permissible vibrational stress	F_{rb}	%	70			50	
Degree of protection to DIN EN 60529			IP 67				

1) see supplementary information according to DIN EN 10002-3 for Z4A-G

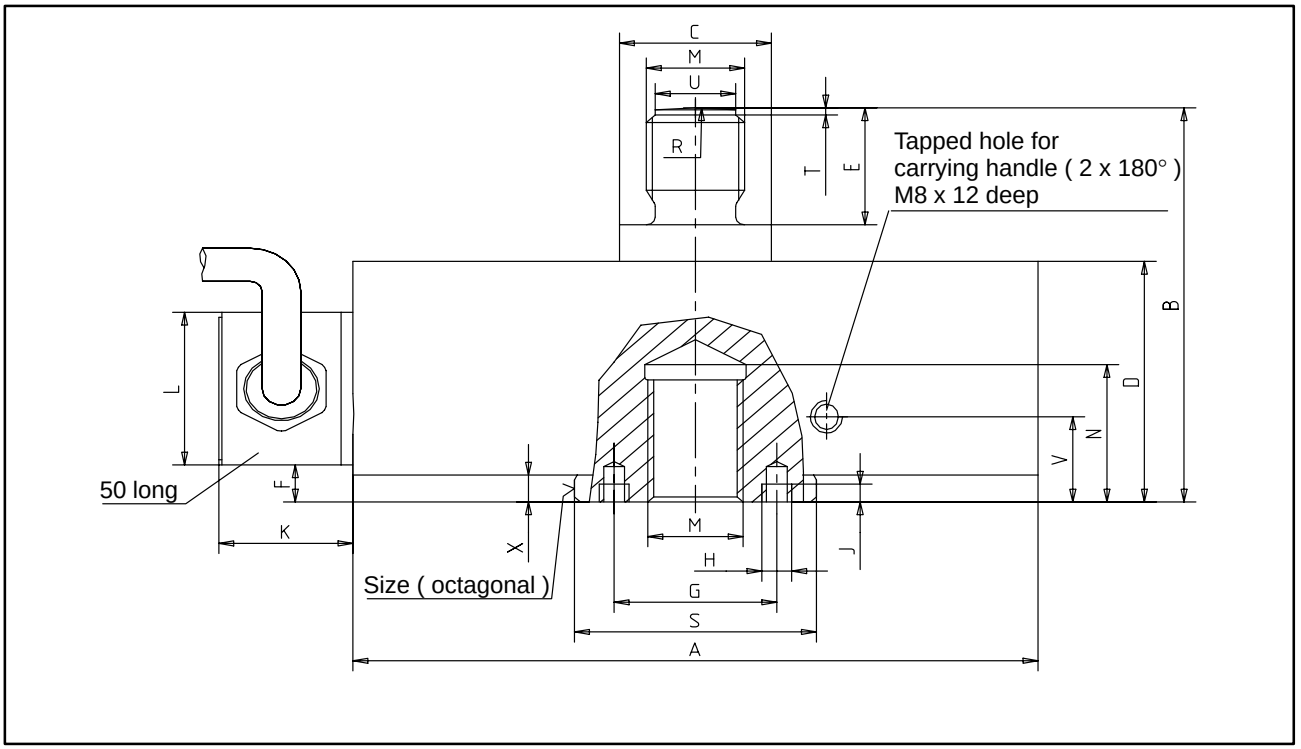
2) half pivot height for Z4A, Z4A-G

Supplementary information according to EN 10002-3 for Z4A-G[3)]							
Nominal force	F_{nom}	kN	20	50	100	200	500
Class according to EN 10002-3 (ISO / FDIS 376)			00				05
rel. zero point compensation (zero signal return)	f_o	%	$< \pm 0.008$ (typically < 0.003)				
Rel. range ($0.1F_{nom}$ to F_{nom}) at:							
unchanged mounting position	b_i	%	< 0.02 (typically < 0.01)				
different mounting positions	b	%	< 0.03 (typically < 0.02)				
Rel. range of inversion ($0.1F_{nom}$ to F_{nom})	u	%	< 0.07 (typically < 0.03)				0.2*) (typ. 0.1)

3) Z4A-G is only available from HBM in conjunction with a DKD calibration according to EN10002-3.

*) applicable for 0.2 F_{nom} to F_{nom}

8 Dimensions Z4A, Z4A-G

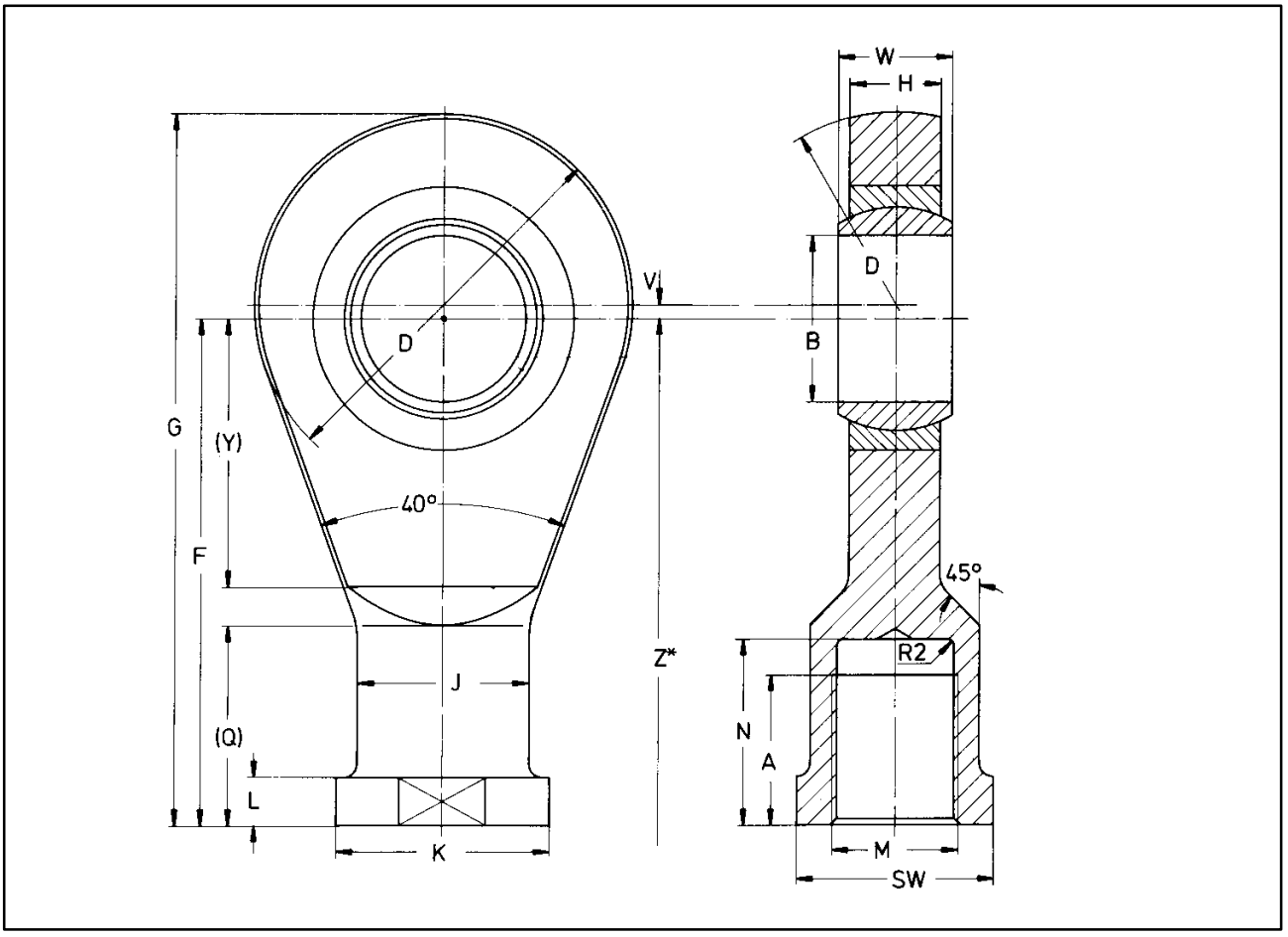


Type	∅ A	B	∅ C_{f7}	D	E	F	G	H	J	M
Z4A/20kN	115	77	25	47	23	7.3	–	–	–	M16
Z4A/50kN	120	83	26	55	23	10.2				M20x1.5
Z4A/100kN	146	107	40	69	33	12.2				M30x2
Z4A/200kN	180	137	50	89	43	13.1	68	M6	6	M39x2
Z4A/500kN	275	250	100	145	95	21	118	M8	8	M72x4

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

Accessories for Z4A and Z4A-G:

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

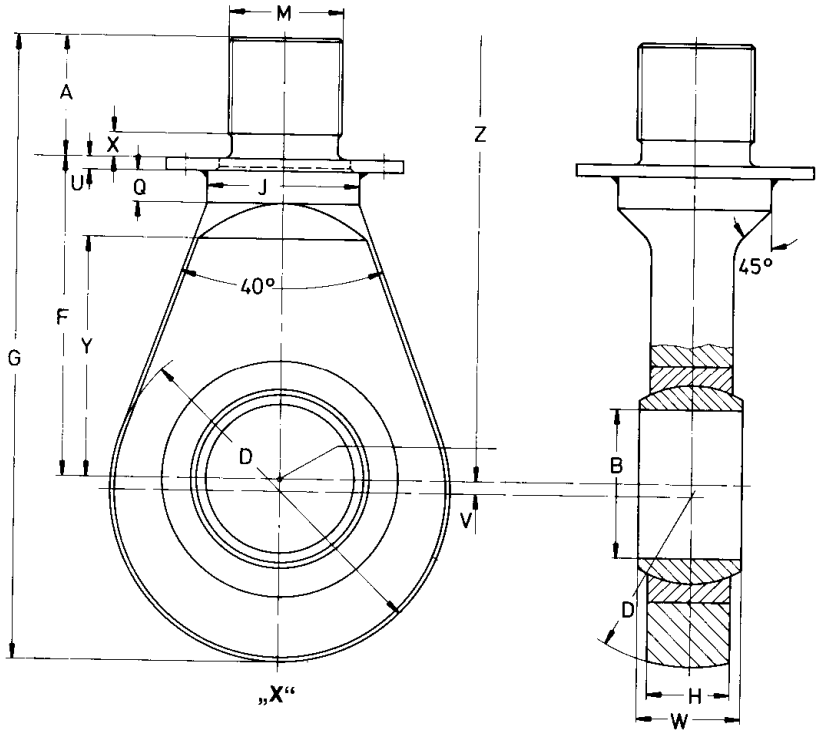


Nominal force in kN	Order no. ZGUW knuckle eye	Weight in kg	A	∅ B	∅ D	F	G	H	∅ J
20	Z4/20kN/ZGOW	0.2	28	16 ^{H7}	42	64	85	15	22
50	U2A/2//ZGOW	0.8	33	20 ^{H7}	50	77	102	18	27.5
100	Z4/100kN/ZGOW	1.1	51	30 ^{H7}	70	110	145	25	40
200	U2A/10T/ZGOW	3.2	115	50 $^{+0.002}_{-0.014}$	115	151	212.5	28	52
500	Z4/500kN/ZGOW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

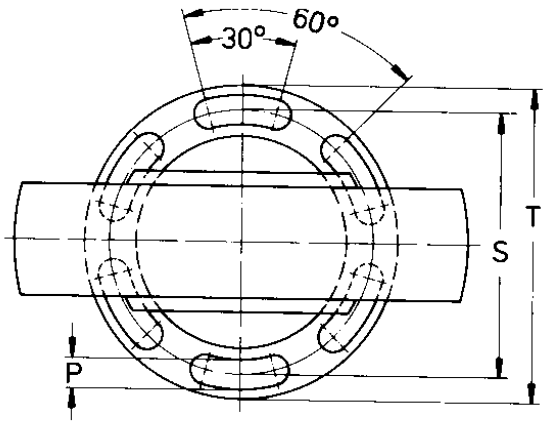
Nominal force in kN	∅ K	L	M	N	Q	a./f.	V	W	Y	Z
20	27	8	M16	–	–	22	–	21	20	163
50	34	10	M20x1.5	–	–	32	–	25	24	190
100	50	15	M30x2	–	–	41	–	37	31	255
200	65	15	M39x2	56	60	60	4	35	78	352
500	128	20	M72x4	107	120	110	7	44	88	570

Accessories for Z4A and Z4A-G:

ZGUW knuckle eye for nominal load 500kN



View ”X”



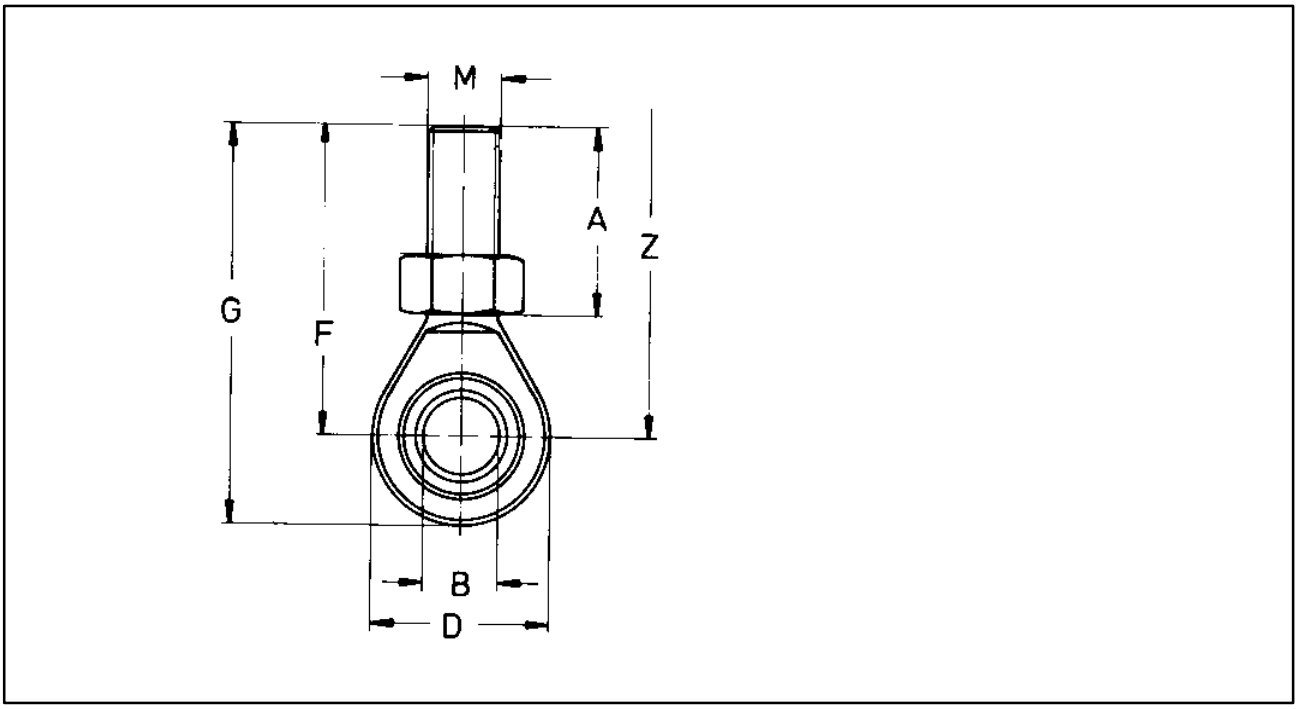
Nominal force in kN	Order no. ZGUW knuckle eye	Weight in kg	A	∅ B	D	F	G	H	M	∅ J
500	Z4/500kN/ZGUW	12	80	$60^{+0.003}_{-0.008}$	180	175	352	36	M72x4	80

Nominal force in kN	P	Q	∅ S	∅ T	U	V	W	X	Y	Z
500 kN	10	24	110	130	4	7	44	10	129	570

HBM 20.11.00

Accessories for Z4A and Z4A-G:

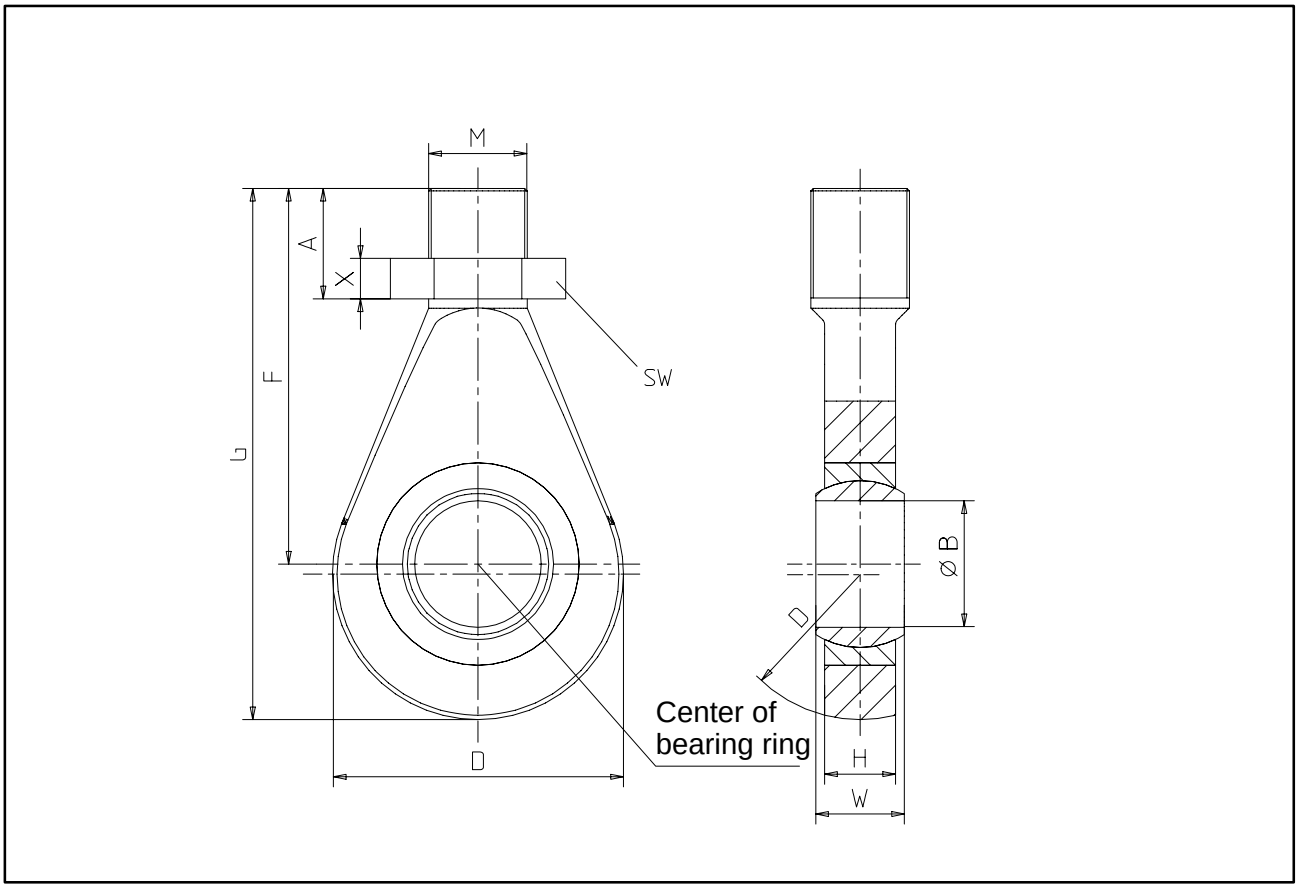
ZGUW knuckle eye for nominal load 20kN and 100kN



Nominal force in kN	Order no. ZGUW knuckle eye	Weight in kg	A	∅ B	∅ D	F	G	M	Z
20	Z4/20kN/ZGUW	0.2	41.7	16^{H7}	42	67.7	88.7	M16	163
100	Z4/100kN/ZGUW	1.1	66.5	30^{H7}	70	110.5	145.5	M30x2	255

Accessories for Z4A and Z4A-G:

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	H	M	a./f.	W	X
50	1-U2A/5t/ ZGUW	0.4	57.5	25^{H7}	60	94.5	124.5	22	M24x2	36	31	10
200	1-U2A/20t/ ZGUW	3.2	80	$60^{+0.003}_{-0.018}$	126	168	236	36	M48x2	75	44	18

9 Declaration of conformity

HOTTINGER BALDWIN MESSTECHNIK

HBM MESS- UND SYSTEMTECHNIK 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: *135/06.1999*

Wir, We, Nous,

HBM Mess- und Systemtechnik 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

Kraftaufnehmer der Typenreihe 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 Mitgliedsstaaten über die elektromagnetische Verträglichkeit, geändert durch 91/263/EWG, 92/31/EWG und 93/68/EWG

Die Absicherung aller produktspezifischen Qualitätsmerkmale erfolgt auf Basis eines von der DQS (Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagementsystemen) seit 1986 zertifizierten Qualitätsmanagementsystems nach DIN ISO 9001 (Reg.Nr. DQS-10001).
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 Qualitätsmanagementsystemen) since 1986 (Reg. No. DQS-10001). 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 Qualitätsmanagementsystemen) certifiant, depuis 1986, notre système d´assurance qualité selon DIN ISO 9001 (Reg.Nr. DQS-10001).
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, 18.06.1999

QV1051A1.03

Seite 2 zu | Page 2 of | Page 2 du

Document: *135/06.1999*

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 50082-2 : 1995 ***Elektromagnetische Verträglichkeit (EMV); Fachgrundnorm Störfestigkeit;*** Teil 2: Industriebereich; Deutsche Fassung

EN 55011 : 1998 ***Funk-Entstörung von Elektrischen Betriebsmitteln und Anlagen;*** *Grenzwerte und Meßverfahren für Funkstörungen von industriellen, wissenschaftlichen und medizinischen Hochfrequenzgeräten (ISM-Geräten) (CISPR 11 : 1997, modifiziert); Deutsche Fassung; Klasse B*

HOTTINGER BALDWIN MESSTECHNIK
HBM Mess- und Systemtechnik GmbH
Postfach 10 01 51, D-64201 Darmstadt
Im Tiefen See 45, D-64293 Darmstadt
Tel.: +49/ 61 51/ 8 03-0; Fax: +49/ 61 51/ 89 48 96;
e–mail: info@hbm.com

www.hbm.com

IM–C 11.00–POD