

HOTTINGER BALDWIN MESSTECHNIK
HBM Mess- und Systemtechnik GmbH



Mounting Instructions

Force transducer
U5

B 20.U5.10 en

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Safety instructions

Use in accordance with the regulations

Force transducers in the U5 range are designed for force measurements on test benches/in press-fit devices/test devices/pressing. 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 of failing to follow the safety instructions

The U5 force transducer corresponds to the state of the art and is fail-safe.

The transducers can give rise to remaining 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.

Remaining 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 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 remaining dangers are pointed out using the following symbols:

Symbol:  **WARNING**


Meaning: **Dangerous situation**

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

Symbol:  **CAUTION**

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**

Means that important information about the product or its handling is being given.

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 Operating Manual).

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. Mounting and dismounting the adapter in accordance with Chapter 5 excluded.

Qualified personnel

This instrument is only to be installed by qualified personnel strictly in accordance with the technical data 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 U5 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

- 1 Force transducer U5
- 1 Operating Manual U5

Accessories (not included in the scope of supply):

- **Adapter**

Measuring range 100kN:

Compressive force adapter each with 8 screws M12 x 50
Order no. 2-9278.0349

Tensile force adapter each with 8 screws M12 x 50
Order no. 2-9278.0350

Bearing plate each with 8 screws M12 x 30
Order no. 2-9278.0351

Measuring range 200kN:

Compressive force adapter each with 8 screws M16 x 55
Order no. 2-9278.0352

Tensile force adapter each with 8 screws M16 x 55
Order no. 2-9278.0353

Bearing plate each with 8 screws M16 x 40
Order no. 2-9278.0354

Measuring range 500kN:

Compressive force adapter each with 8 screws M20 x 65
Order no. 2-9278.0355

Tensile force adapter each with 8 screws M20 x 65
Order no. 2-9278.0356

Bearing plate each with 8 screws M20 x 65
Order no. 2-9278.0357

- **Knuckle eye ZGUW**

100 kN: Order no. 1-Z4/100kN/ZGUW

200 kN: Order no. 1-U2A/10t/ZGUW

500 kN: Order no. 1-Z4/500kN/ZGUW

- **Thrust piece EPO** (including strain washer)

100 kN: Order no. 1-EPO3R/20T

200 kN: Order no. 1-EPO3R/20T

500 kN: Order no. 1-EPO3/100T

- **Cable/Connector**

Connection cable Kab139A–6, 6m, with cable socket 723 and free ends;
Order number: 1–KAB139A–6

Connector MS3106PEMV mounted on Kab139A;
Order number: D–MS/MONT

15–pin D–Sub connector (male) mounted on Kab139A;
Order no.: D–15D/MONT

2 Application information

Force transducers of the U5 type series are suitable for measuring tensile and compressive forces. They measure static and dynamic forces extremely accurately and therefore require careful handling. You must take particular care when transporting and installing the devices. If you knock or drop the transducers, this could permanently damage them.

The housing provides an elaborate seal to protect the sensitive strain gauge applications and it is essential that this is preserved. Therefore be particularly careful around the top and bottom of the housing (see Fig. 3.1).

The limits for the permissible mechanical thermal and electrical stresses are stated in the Specifications. It is essential that these are taken into consideration in planning the measuring set-up, during installation and finally, during operation.

3 Structure and mode of operation

3.1 Measuring element

The measuring element is a measuring spring made from stainless steel, to which strain gauges (S.G.) are applied. The S.G. are arranged so that four of them can be strained and the other four compressed when the transducer reacts to a force.

3.2 Housing

The housing with the integrated measuring spring is completed underneath and on top by an attached cover. No weight must be placed on this cover. It should be protected against mechanical damage.

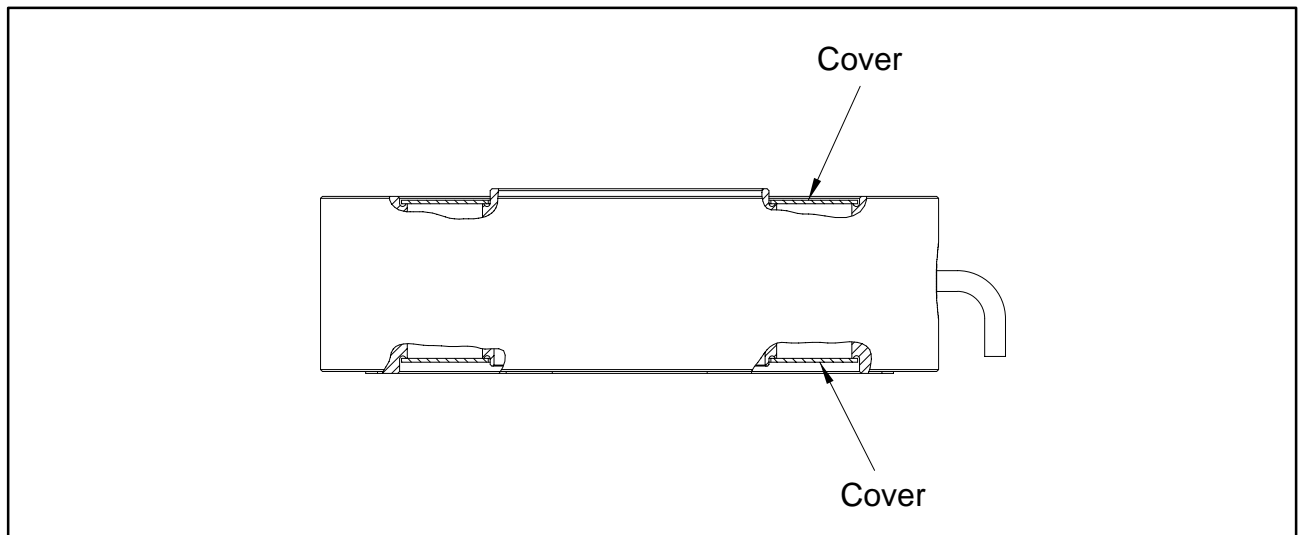


Fig. 3.1 Cover position

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 are caused by heating (e.g. radiant heat) or cooling on one side. A radiation barrier and all-round thermal insulation will produce a marked improvement, but should not form a force shunt radiation shield

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 IP65 under DIN EN 60529).



NOTE

Moisture must not be allowed to penetrate the free end of the connection cable.

4.3 Deposits

Dust, dirt and other foreign bodies must not be allowed to accumulate such that they divert part of the measured force onto the housing and so falsify the measured value (force shunt).



NOTE

Foreign bodies must not be allowed to clog the gap beneath the flange surface.

5 Mechanical installation

5.1 Important measures for installation

- Treat the transducer gently.
- Make sure that there is a rigid base when measuring compressive forces.
- The force-introduction surfaces must be totally clean and fully bearing.
- Comply with the engagement depths for threaded rods or knuckle eyes.
- Do not overload the transducer.
- Either during installation or immediately afterwards, the transducer should be bridged by a 50mm² stranded copper wire (highly flexible earthing cable EEK from the HBM line). The cable is attached by screws both above and below the transducer. This prevents welding current flowing over the transducer and welding the force introduction point.



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 direction of measurement in which the forces work should be as much towards the transducer as possible. Torsion and bending moments, eccentric loading and transverse forces may result in measurement errors and if the limit values are exceeded, could destroy the transducer.

The transducer can take up 50% (60% at 100kN) of its nominal force as transverse force by reference to a force introduction point on the force-introduction surface, without losing its mechanical competence.

As mounting accessories for the transducers, HBM supplies U5 standard range knuckle eyes and adapters as accessories. Knuckle eyes are suitable for use during quasi-static loading (10Hz alternating loads). In the case of dynamic loading at a higher frequency, you should use flexible tension bars. Knuckle eyes 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.

Various installation fastenings are possible for the transducer (see Fig. 5.1 to Fig. 5.4).

The sensitivity of the transducer is adjusted for installation using the flange thread. Should the characteristic tolerance for using the through-holes be insufficient, it is possible to carry out a factory calibration for this special installation situation.

5.3 Installation for tensile loading/compressive loading

5.3.1 Installation without adapter

The transducer is screwed directly on to an existing structural element (e.g. profile, cover, plate). This type of installation enables the transducers to measure axial forces in the tensile force **and** compressive force directions. Alternating loads can also be recorded perfectly. To achieve this, the transducer must be mounted without any axial play, which is made easier by centering aids on the top and bottom of the transducers.

Usable centering assistance on the top is 2.5mm and on the bottom, 1.5mm (see page 24).

- The structural elements provided by the customer must be parallel to one another. The screws must be tightened in a diagonally opposite sequence.

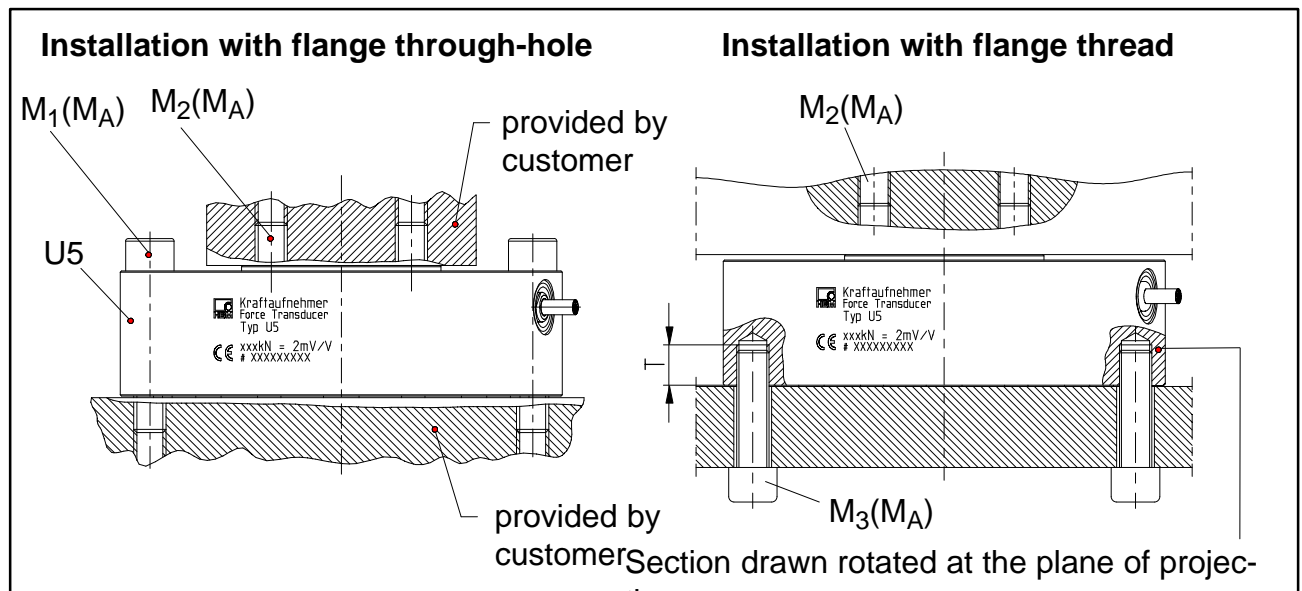


Fig. 5.1 Installation for tensile loading/compressive loading

Nominal force (kN)	Starting torque M_A (Nm)	Screws for transducer mounting M_1 (flange through-hole)		T (mm)
		Resistance class 10.9		
		metric	UNF	
100	115	8 x M12	8x1/2"	approx. 15
200	280	8 x M16	8x5/8"	approx. 19
500	560	8 x M20	8x3/4"	approx. 23

Nominal force (kN)	Screws for transducer mounting M_3 (flange thread)	Resistance class 10.9	Screws M_2	
			Resistance class 10.9	
100	8xM12		8 x M12	
200	8xM16		8 x M16	
500	8xM20		8 x M20	

5.3.2 Installation with tensile force adapter and knuckle eye

If the transducer is to be tensile force loaded, it can be mounted with an adapter (HBM accessory) and a knuckle eye. A centering hole is located on both sides of the transducer.

When knuckle eyes are used, the breaking force is reduced to 150%. Knuckle eyes are only suitable for use with quasi-static loading (alternating loads $\leq 10\text{Hz}$).

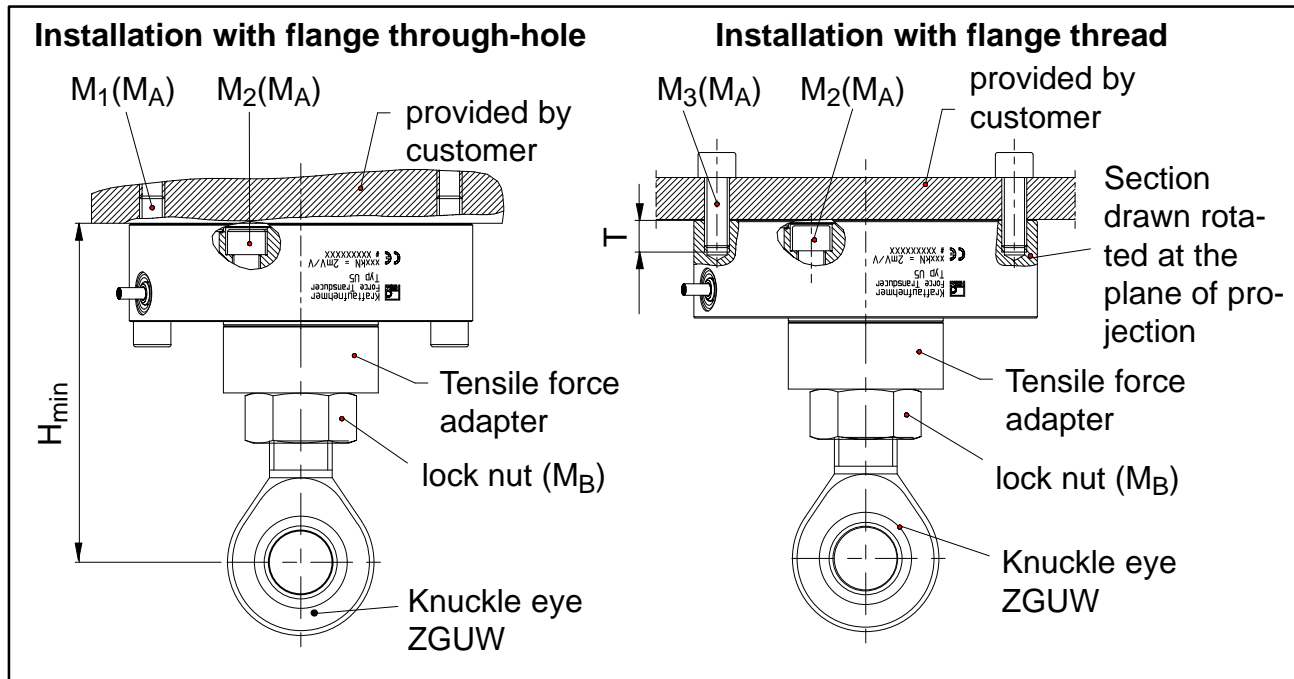


Fig. 5.2 Installation for tensile loading

Nominal force (kN)	H _{Min} (mm)	Starting torque M _A (Nm)	Starting torque M _B (Nm)	Screws for adapter mounting M ₂ ¹⁾	T (mm)
100	app. 159	115	1900	8xM12x50	app. 15
200	app. 203	280	4300	8xM16x55	app. 19
500	app. 319	560	— ²⁾	8xM20x70	app. 23

1) included in the scope of supply for the tensile force adapter

2) secured with 2 screws to prevent torsion

Nominal force (kN)	Screws for transducer mounting M ₁ (flange through-hole) Resistance class 10.9		Screws for transducer mounting M ₃ (flange thread) Resistance class 10.9
	metric	UNF	
100	8 x M12	8x1/2"	8xM12
200	8 x M16	8x5/8"	8xM16
500	8 x M20	8x3/4"	8xM20

Attaching the knuckle eye:

- Screw the correct adapter (dependent on nominal force!; see Chapter1) to U5 (taking screw length into account)
- Turn the lock nut back as far as the eye
- Screw the knuckle eye into the adapter as far as the stop
- Unscrew knuckle eye 1 to 2 turns and align
- Load eye with nominal load
- Tighten lock nut (M_B , lock using the flat of the adapter)



CAUTION

When locking with the lock nut, under no circumstances let the torque be transmitted through the transducer.

5.3.3 Installation with two knuckle eyes

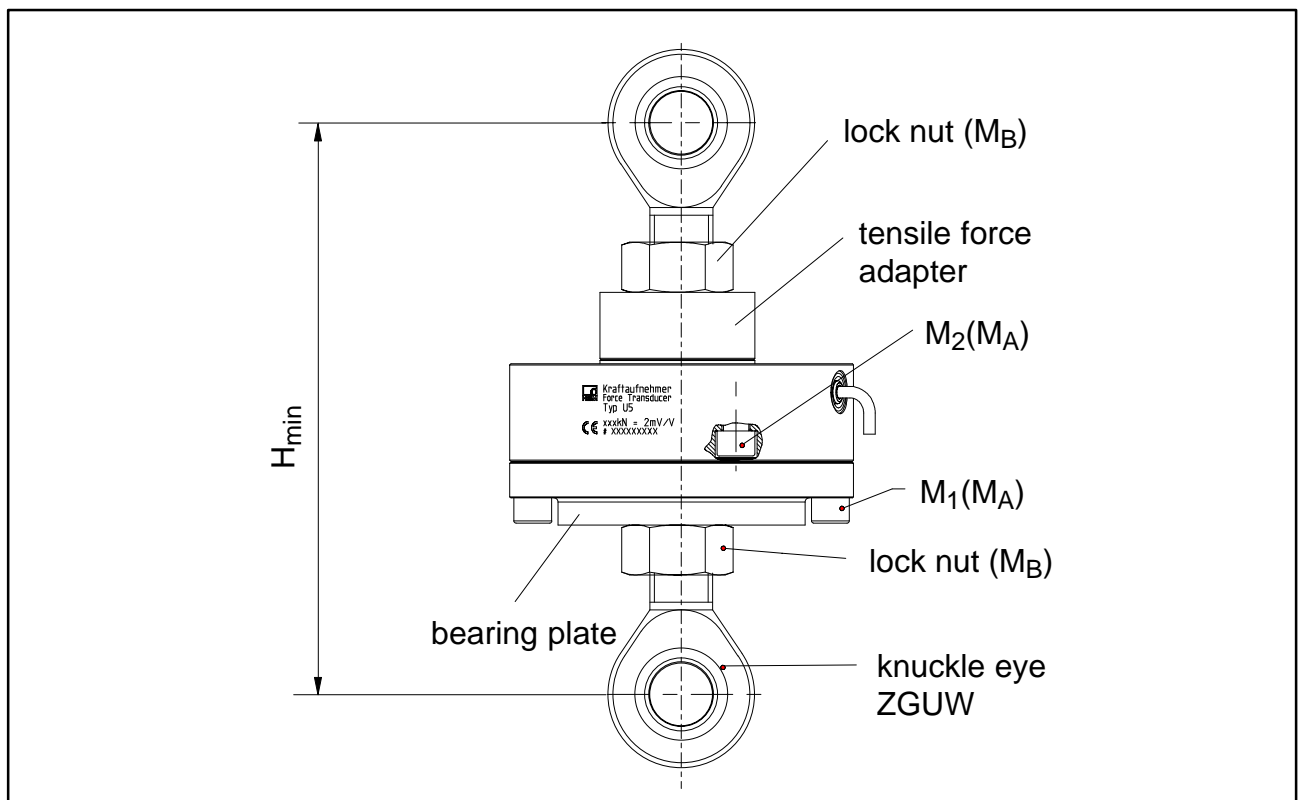


Fig. 5.3 Installation for tensile loading with two knuckle eyes

When knuckle eyes are used, the breaking force is reduced to 150%. Knuckle eyes are only suitable for use with quasi-static loading (alternating loads $\leq 10\text{Hz}$).

Nominal force (kN)	H _{Min} (mm)	Starting torque M _A (Nm)	Starting torque M _B (Nm)	Screws for adapter mounting M ₂	Screws for adapter mounting M ₁ metric
100	app.269	115	1900	8xM12x50	8xM12
200	app.351	280	4300	8xM16x55	8xM16
500	app.494	560	– *)	8xM20x65	8xM20

*) secured with 2 screws to prevent torsion

Attaching the knuckle eye:

- Screw the correct adapter (dependent on nominal force!, see Chapter1) to U5 (taking screw length into account)
- Turn the lock nut back as far as the eye
- Screw the knuckle eye into the adapter as far as the stop
- Unscrew knuckle eye 1 to 2 turns and align
- Load eye with nominal load
- Tighten the lock nut (M_B)



CAUTION

When locking with the lock nut, under no circumstances let the torque be transmitted through the transducer.

5.3.4 Installation with compressive force adapter

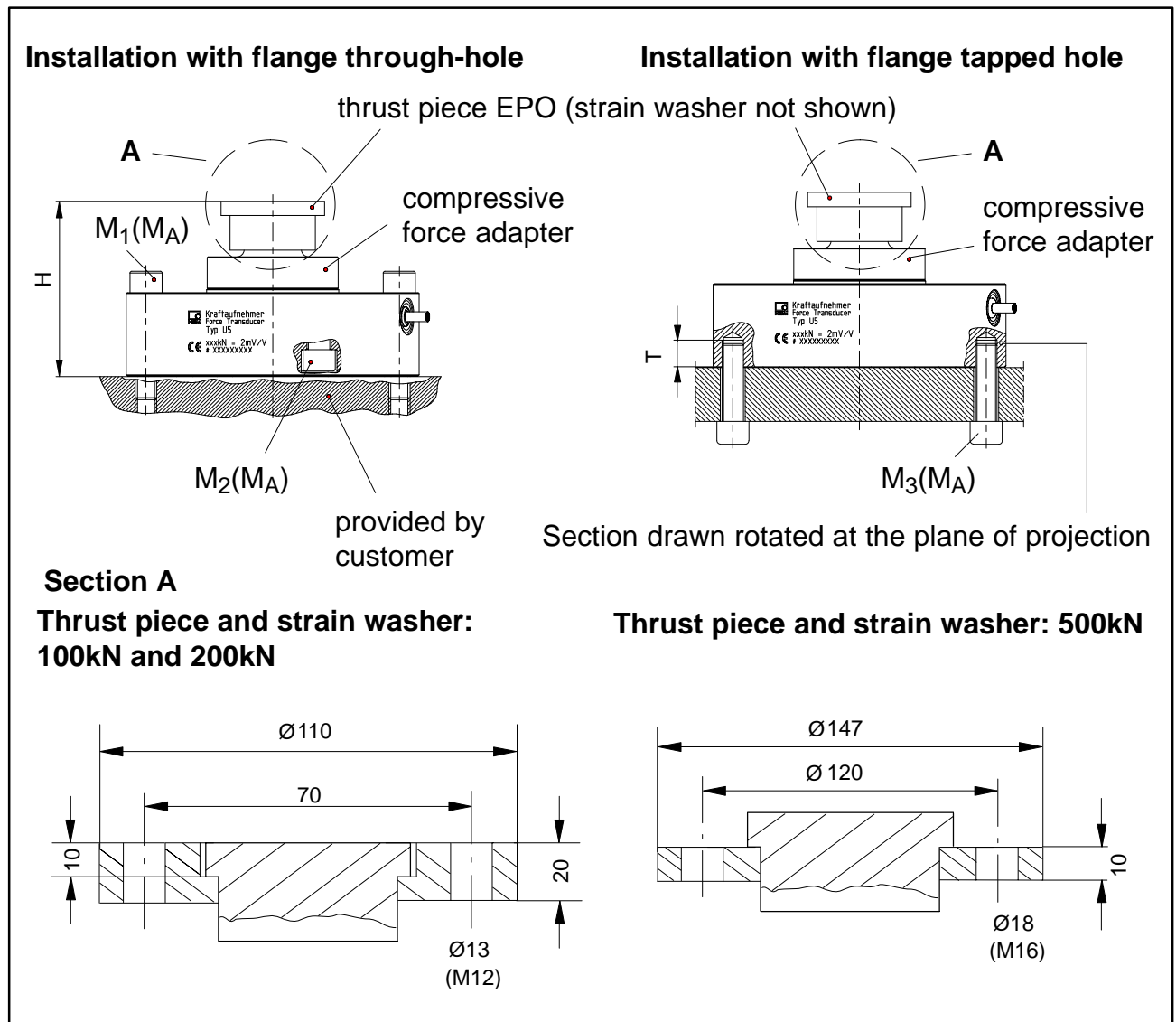


Fig. 5.4 Installation for compressive loading with the compressive force adapter

Nominal force (kN)	H _{Min} (mm)	Starting torque M _A (Nm)	Screws for adapter mounting M ₂	T (mm)
100	99	115	M12x50	approx.15
200	115	280	M16x55	approx.19
500	157	560	M20x65	approx.23

Nominal force (kN)	Screws for transducer mounting M ₁ (flange through-hole) Resistance class 10.9		Screws for transducer mounting M ₃ (flange thread) Resistance class 10.9
	metric	UNF	
100	8xM12	8x1/2"	8xM12
200	8xM16	8x5/8"	8xM16
500	8xM20	8x3/4"	8xM20

6 Electrical connection

Transducers are available with the following electrical connections:

- Cable with free ends (standard)

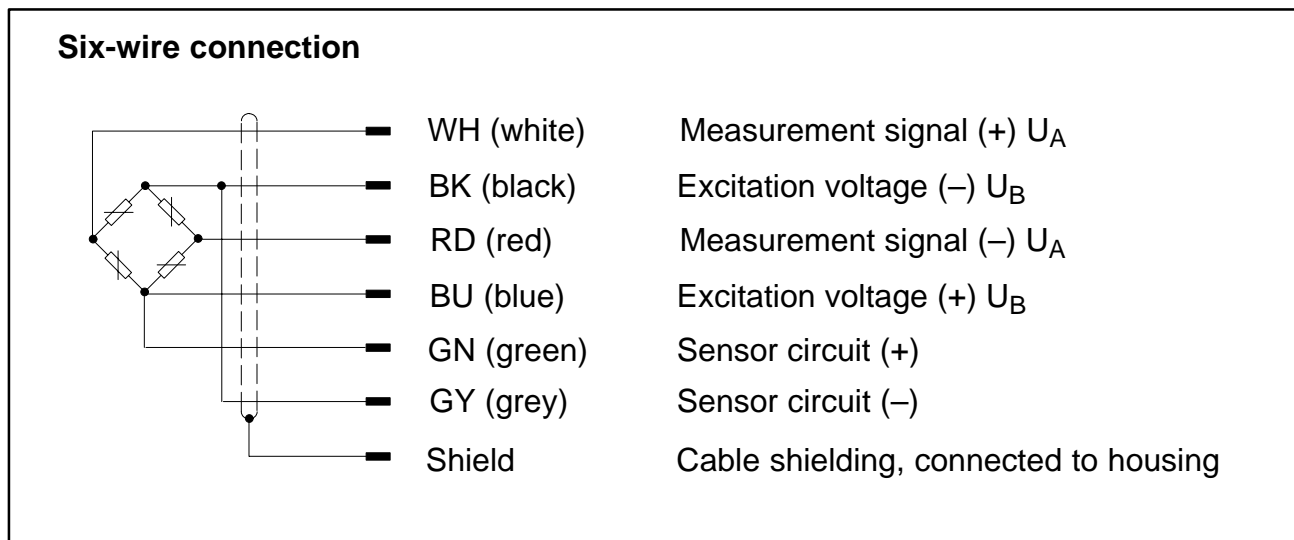
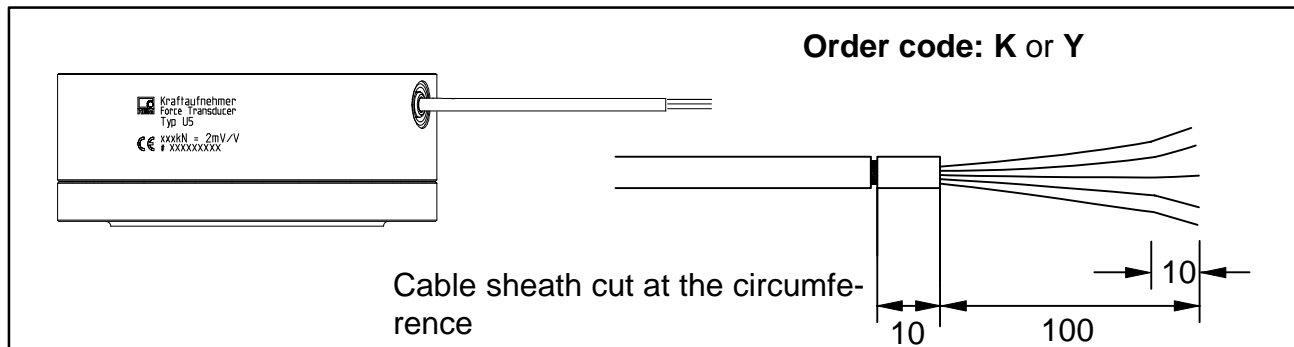
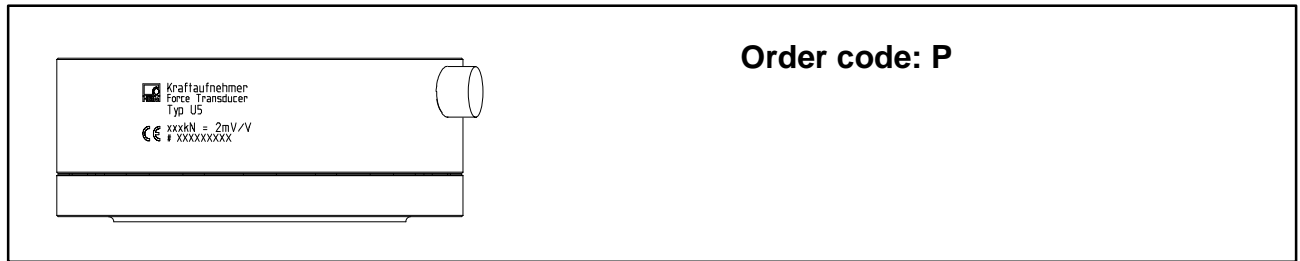


Fig. 6.1: Pin assignment of the U5 with free ends

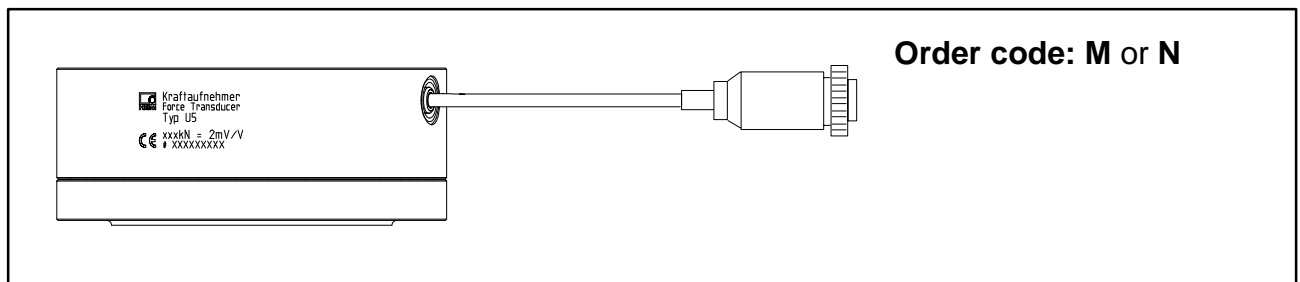
- There is a 7-pin male device connector (Binder 723) on the housing



	Binder pin male connector	Assignment	Wire colour
<p>Top view</p> <p>Binder 723</p>	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. 6.2: Binder connector series 723 (attached)

- Cable with MS connector (male)



	MS male connector pin	Assignment	Wire colour
<p>Top view</p>	A	Measurement signal (+)	WH
	B	Excitation voltage (-)	BK
	C	Excitation voltage (+)	BU
	D	Measurement signal (-)	RD
	E	No function	-
	F	Sensor circuit (+)	GN
	G	Sensor circuit (-)	GY

Fig. 6.3: MS male connector pin assignment

- Cable with sub-D male connector

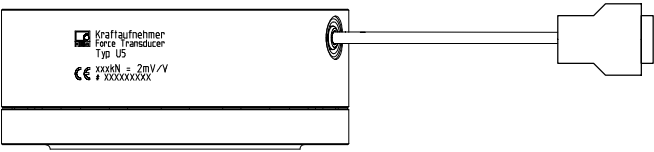
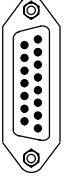
		Order code: D or F	
Top view 	Sub-D connector pin	Assignment	Wire colour
	1	Measurement signal (+)	WH
	2	Excitation voltage (-)	BK
	3	Excitation voltage (+)	BU
	4	Measurement signal (-)	RD
	13	Sensor circuit (+)	GN
	12	Sensor circuit (-)	GY

Fig. 6.4: Sub-D male connector assignment

The cable shielding is connected in accordance with the Greenline concept. This means that the measurement system is surrounded by a Faraday cage and is not affected by electromagnetic interference.

Connectors to CE standard are to be fitted at the free cable 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).

6.1 Order code

Code	Option 1: Measuring range
100K	Measuring range 100kN
200K	Measuring range 200kN:
500K	Measuring range 500kN

Code	Option 2: Electrical connection
K	with cable, 6m, free ends
M	with cable, 6m, MS connector (male)
D	with cable, 6m, D15 connector
Y	with cable, any length, max. 20m, free ends
N	with cable, any length, max. 20m, MS connector (male)
F	with cable, any length, max. 20m, D15 connector
P	with Binder 723 male connector

K-U5-

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6.2 Instructions for cabling

- Always use shielded, low-capacity measurement cable, available from HBM.
- 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 measurement chain are to be connected to the same earthed conductor.
- The screen of the connection cable is connected to the transducer housing.

Connecting to terminals:

1. You can get to the screen through a slit in the cable sheath (see page 18).
2. Lay the screen flat on the housing frame.

Attaching to a male connector:

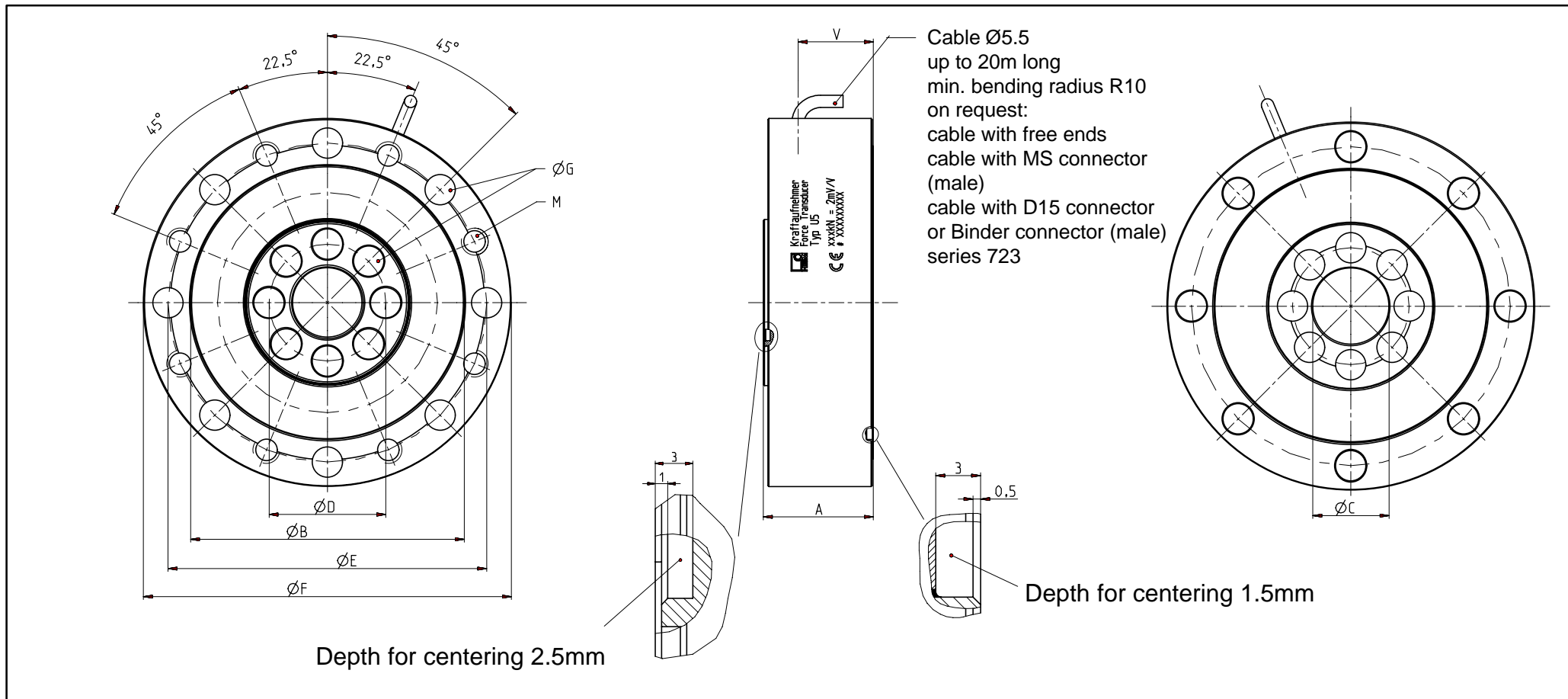
Lay the cable shield flat on the connector housing.

7 Specifications (VDI/VDE2638)

Nominal force	F_{nom}	kN	100	200	500
Accuracy class			0.1		0.3
Nominal sensitivity	C_{nom}	mV/V	2		
Relative sensitivity deviation compressive force	d_C	%	< ± 0.25		
Relative tensile/compressive force sensitivity difference	d_{zd}	%	< ± 0.2 (typ. 0.07)	< ± 0.5 (typ. 0.02)	< ± 2 (typ. 1%)
Compressive force sensitivity difference when using through-holes on outer ring	d_{dd}	%	< $\pm 0.2\%$ (typically 0.07)		< +1 (typ. 0.5%)
Relative zero signal deviation	$d_{s,0}$	%	< 1		
Rel. range of inversion ($0.5F_{nom}$)	$u_{0.5}$	%	< 0.2		
Linearity deviation compressive force	d_{lin}	%	< 0.1		
Linearity deviation tensile force	d_{lin}	%	< 0.1		< 0.3
Effect of temperature on sensitivity/10K by ref. to sensitivity	TK_C	%	0.1		
Effect of temperature on zero signal/10K by ref. to sensitivity	TK_0	%	0.1		
Effect of transverse forces (transverse force 10% F_{nom})*	d_Q	%	< ± 0.1		
Eccentricity effect / mm		%	< ± 0.1		
Rel. creep over 30 min	d_{crF+E}	%	< ± 0.05		
Input resistance	R_e	Ω	> 345		
Output resistance	R_a	Ω	300 – 400		
Isolation resistance	R_{is}	Ω	> 2×10^9		
Reference excitation voltage	U_{ref}	V	5		
Operating range of the excitation voltage	$B_{U,G T}$	V	0.5 to 12		
Nominal temperature range	$B_{t,nom}$	$^{\circ}C$	-10 to +70		
Operating temperature range	$B_{t,G}$	$^{\circ}C$	-30 to +85		
Storage temperature range	$B_{t,S}$	$^{\circ}C$	-50 to +85		
Reference temperature	t_{ref}	$^{\circ}C$	+23		
Max. operational force	(F_G)	%	150		
Limit force	(F_L)	%	150		
Breaking force	(F_B)	%	> 300	> 250	
Static lateral limit force *	(F_Q)	%	60	50	
Per. torque	M_g	kNm	1	2	5
Nominal displacement	S_{nom}	mm	0.09	0.11	0.16
Fundamental resonance frequency	f_G	kHz	4.8	4.3	3.3

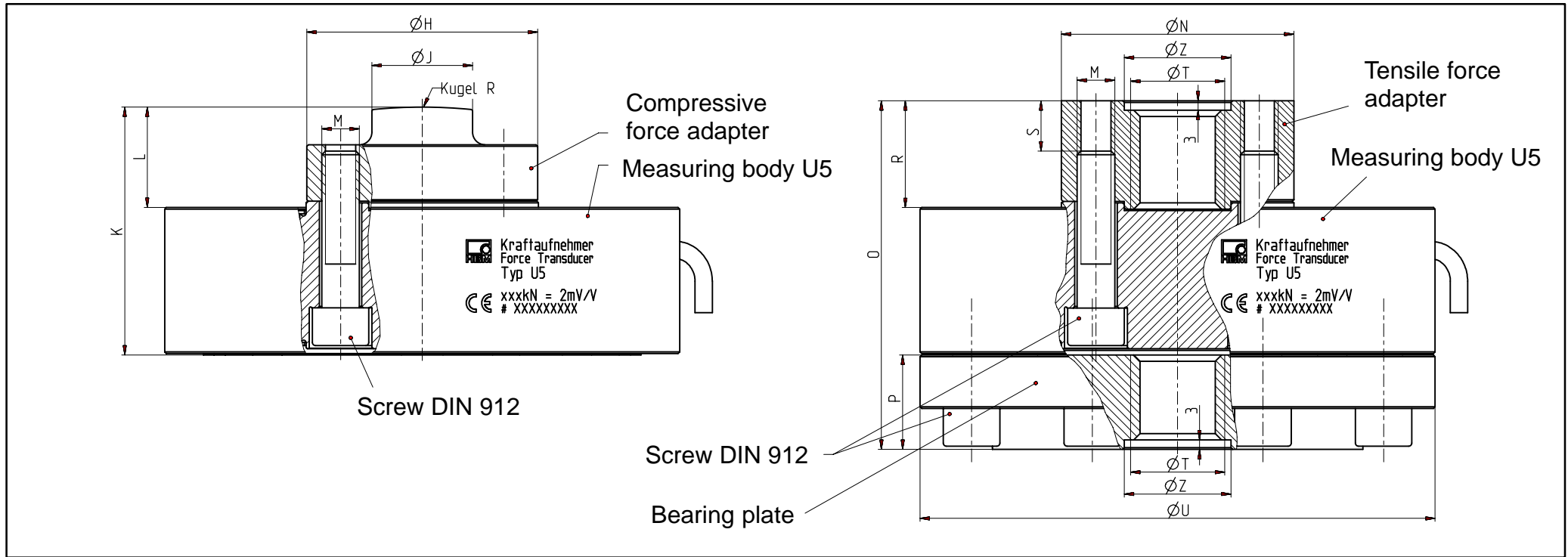
* by reference to a force introduction point on the force-introduction surface

Nominal force	F_{nom}	kN	100	200	500
Weight		kg	5	7	17
Rel. permissible vibrational stress	F_{rb}	%	160		100
Degree of protection to DIN EN60529			IP65		
Cable length, six-wire connection			Standard 6m		
Alternatively Cable with free ends up to 20m			See order code page 20		
MS connector (male) or			See order code page 20		
D15 connector or			See order code page 20		
Binder connector series 723 on the transducer			See order code page 20		



Nominal force	A	$\varnothing B_{-0.02}$	$\varnothing C^{H8}$	$\varnothing D$	$\varnothing E$	$\varnothing F$	$\varnothing G$	V	Mx usable depth
100 kN	49	122	34	52	142	164	13.5	33.5	M12 x approx.15 deep
200 kN	55	144	43	67	166	190	17	37.5	M16 x approx.19 deep
500 kN	65	186	76	104	225	260	21	48	M20 x approx.23 deep

8.1 Dimensions mounting accessories for measurement of compressive/tensile force



Mounting accessory for measurement of compressive force (compressive force adapter)

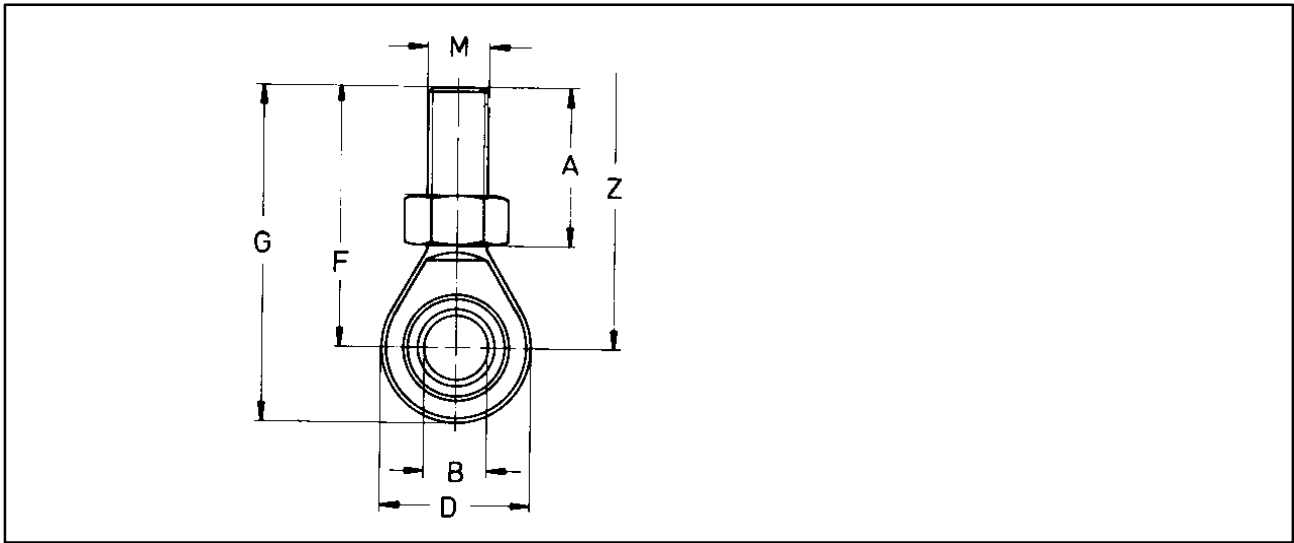
Nominal force	ØJ	ØH	K	L	M	Ball R
100kN	32	73.5	79	32	M12	160
200kN	32	95.5	95	42	M16	160
500kN	64.6	140	118	55	M20	400

Mounting accessory for measurement of tensile force (tensile force adapter)

Nominal force	Ø N	M	O	P	R	S	ØT	ØU	ØZ+0.1
100kN	74	M12	111	30	34	appr. 16	M30x2	164	34
200kN	96	M16	137	40	44	appr. 20	M39x2	190	43
500kN	138	M20	224.5	80	81.5	appr. 55	M72x4	260	76

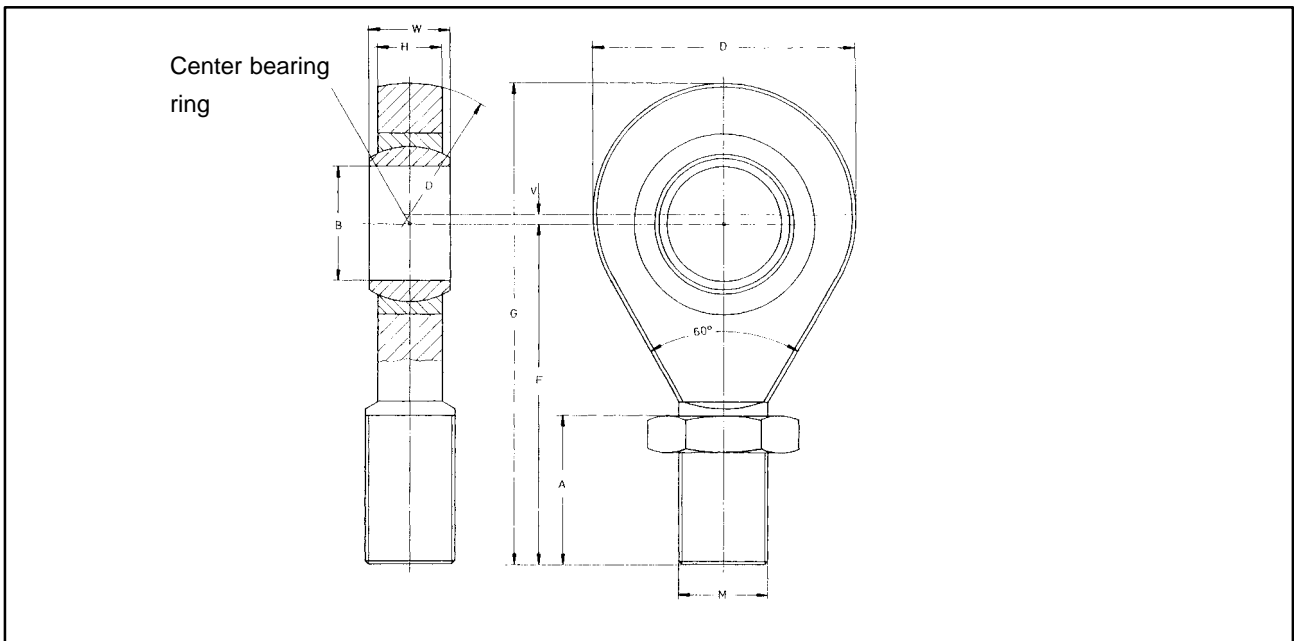
8.2 Knuckle eyes/thrust piece

Knuckle eye ZGUW for nominal load 100 kN



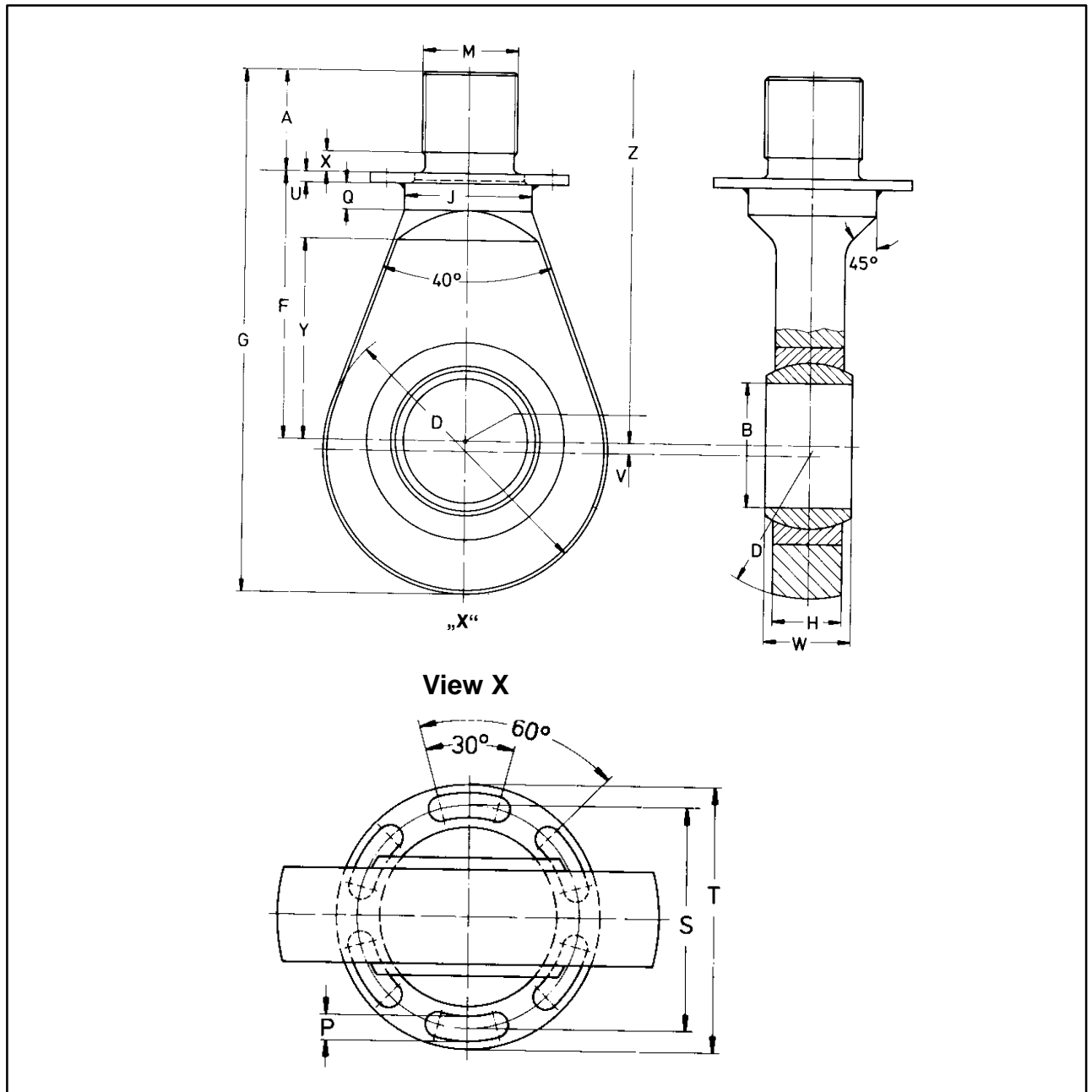
Nominal force in kN	Order no. knuckle eye ZGUW	Weight in kg	A	∅ B	∅ D	F	G	M	Z
100	1-Z4/100kN/ ZGUW	1.1	66.5	30 ^{H7}	70	110.5	145.5	M30x2	255

Knuckle eye ZGUW for nominal load 200 kN



Nominal force in kN	Order no. knuckle eye ZGUW	Ge-wicht in kg	A	∅ B	∅ D	F	G	H	M	V	W
200	1-U2A/10t/ ZGUW	1,1	65,5	50 ^{+0,002} -0,014	115	148,5	210	28	M39x2	4	35

Knuckle eye ZGUW for nominal load 500kN



Nominal force in kN	Order no. knuckle eye ZGUW	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
500kN	10	24	110	130	4	7	44	10	129	570

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: 147/05.2000

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

Typ U5 100kN/200kN/500kN

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, 93/68/EWG und 93/97/EWG*

Die Absicherung aller produkt-spezifischen 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-00001). 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-00001). 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-00001). 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, 2000-05-18

CV1051A1.04

HBM 29.6.00

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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 caractère. 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); Deutsche Fassung, Klasse B

QV1051A1.04



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