

HOTTINGER BALDWIN MESSTECHNIK



**Electrical
measurement
of mechanical
quantities**

Mounting instructions

**Absolute pressure transducer
P8AP**

Contents	Page
Safety instructions	4
1 List of components supplied	7
2 Field of application	7
3 Mechanical construction	7
4 Electrical connection	8
4.1 Pin assignment	8
5 Technical Data (in accordance with DIN 16086)	9
6 Dimensions	10
7 Options	11
8 Copy of Declaration of Conformity	14

Safety instructions

Use in accordance with the regulations

The P8AP pressure transducer is to be used exclusively for pressure measurement and directly related control tasks. Use for any additional purpose shall be deemed to be not in accordance with the regulations.

To ensure safe operation the differential pressure gauge must be used only in accordance with the information in the User Manual. It is also essential to comply with the statutory and safety regulations relevant to the particular application. This also applies to the use of accessories.

The differential pressure gauge is not a safety device even when used in accordance with the regulations. Perfectly safe operation of the differential pressure gauge requires proper transport, technically correct storage, installation and assembly as well as careful operation and maintenance.

General dangers in non-observance of the safety instructions

The P8AP absolute pressure transducer corresponds to the state of the art and is safe to operate. The differential pressure gauge may give rise to further dangers if it is inappropriately installed and operated by untrained personnel.

Any person instructed to carry out installation, commissioning, maintenance or repair of the differential pressure gauge must have read and understood the User Manual and in particular the technical safety instructions.

Residual dangers

The scope of supply and list of components supplied with the absolute pressure transducer cover only part of the scope of measurement technology. In addition, equipment planners, installers and operators should plan, implement and respond to the safety engineering considerations of measurement technology in such a way as to minimise remaining dangers. All existing regulations must be complied with. Reference must be made to remaining dangers connected with measurement technology.

Residual dangers are highlighted in this manual with the following symbols:



Symbol:  *Meaning:* Danger for personnel

This symbol advises that failure to comply with the safety instructions can lead to severe physical injury or death.




Symbol:  *Meaning:* Danger for property

This symbol advises that failure to comply with the safety instructions may cause damage to property (destruction of components).

Notes



Symbol:  *Meaning:* Note

This symbol advises that useful additional information is given at this point.

Conversions and modifications

The differential pressure gauge must not be modified from the design or safety engineering point of view except with our express agreement. Any modification precludes liability on our part for any damage resulting therefrom. In particular, any repairs, soldering work on motherboards or replacement of components is prohibited. Repairs may be carried out only by HBM.

Qualified personnel

This instrument is only to be installed and used by qualified personnel strictly in accordance with the technical data and with the safety rules and regulations below. It is also essential to comply with the statutory and safety regulations relevant to the particular application. This also applies to the use of accessories.

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

Accident prevention

Even though the specified pressure in the destructive range is a multiple of the final value of the measuring range, the relevant accident prevention regulations of the trade safety associations must be taken into consideration. Thus, for example, a burst protector is to be provided on the transducer where conditions cannot be perfectly defined.

1 List of components supplied

- 1 P8AP absolute pressure transducer
- 1 User Manual

2 Field of application

The P8AP series of absolute pressure transducers are suitable for measuring static and dynamic pressures in fluids and gases. They are available for ranges 0...10, 0...20, 0...50, 0...100, 0...200 and 0...500bar. Regardless of where they are installed, the handy and compact transducers can be used even in situations where space is at a premium.

3 Mechanical construction

P8AP pressure transducers are fitted with a connector tube ($\varnothing 10\text{mm}$).

Where mechanical loading is high due to vibration or oscillation, and during dynamic pressure measurement, we recommend retaining-ring glands on safety grounds.

All commercially available clipping and retaining-ring glands can be used in combination with the P8A during installation. The principle of clipping-ring glands is illustrated in Fig.3.1 by the example of a progressive-ring gland made by Ermeto Armaturen GmbH.

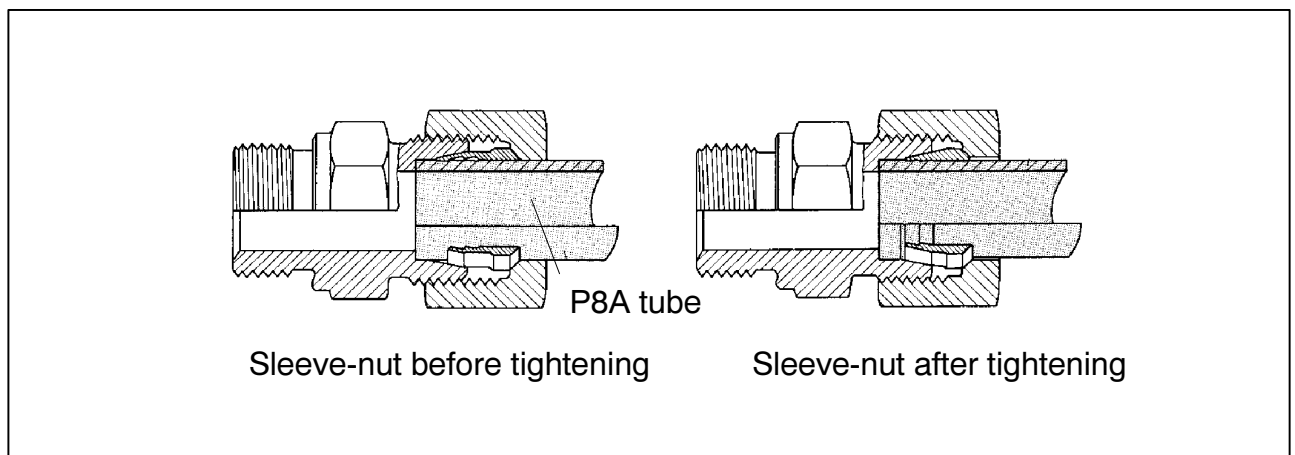


Fig.3.1: Principle of the clipping-ring gland

Fitting:

- Slide sleeve-nut and seal onto tube
- Plug tube into gland connection-piece
- Tighten sleeve-nut

Transducers can be installed wherever required at the site of measurement.

4 Electrical connection

P8AP transducers are delivered with a 5m length of unterminated cable. The cable shielding is connected in accordance with the Greenline concept. By this method the measuring system is enclosed in a Faraday cage. This means that the measuring system is unaffected by electromagnetic interference. Transducers with unterminated cable must be fitted with connectors conforming to EC standards. The shielding has to be put on smoothly. If transducers are connected to amplifiers by any other method, the wiring loom must be fitted with an EMC-stable shield, and similarly the shielding must be put on smoothly (see also HBM Greenline Information (publication G 36.35.0)).

4.1 Pin assignment

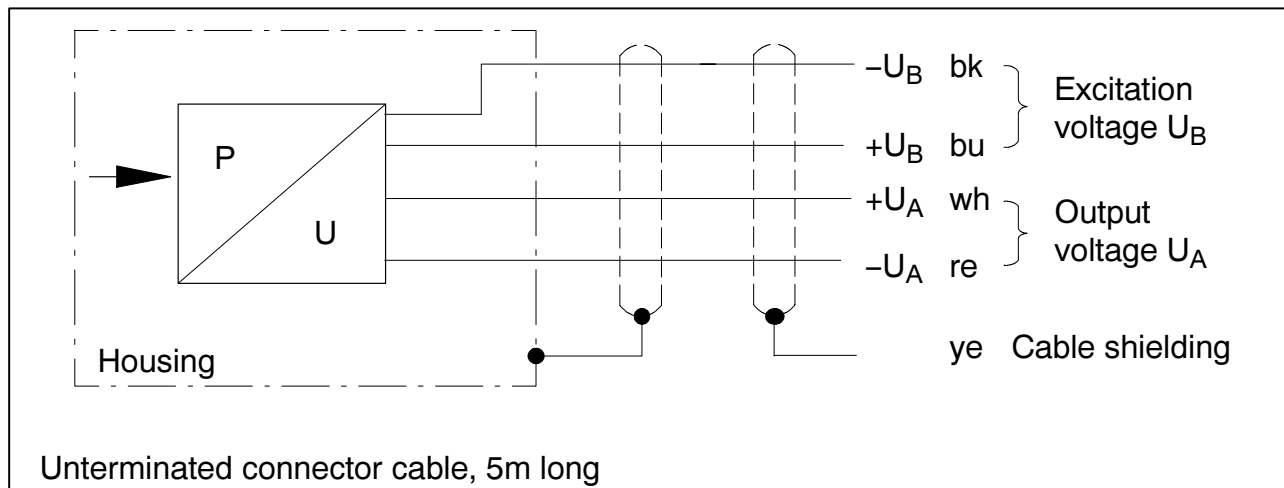


Fig.4.1: Pin assignment

The pin assignment for amplifiers, compensators and channel transfer units from HBM is as follows:

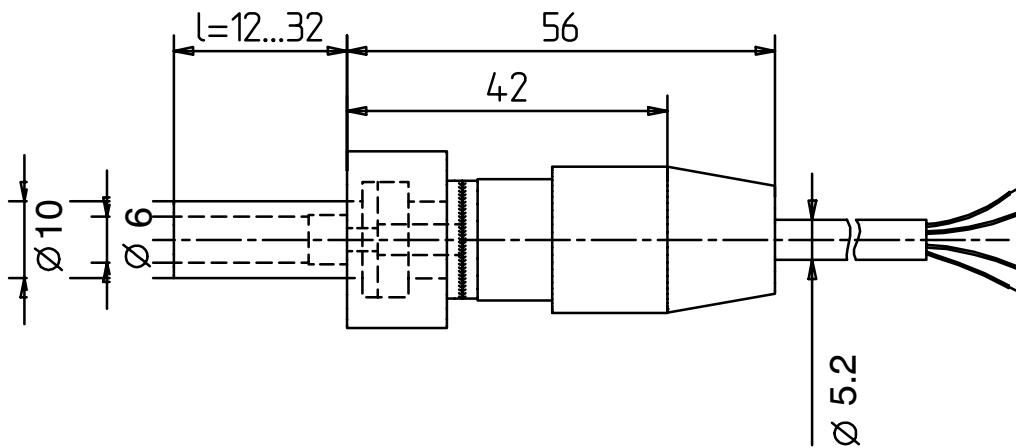
Cable termination at the transducer	wh	bk	bu	re	ye
Clamped or soldered connections	22	21	20	19	12
Amphenol connector pole	A	B	C	D	E
Tuchel connector pole	1	2	3	4	5

5 Technical Data (in accordance with DIN 16086)

Type	P8AP						
Accuracy class	0.3						
Mechanical input characteristics							
Measurement span	bar	10	20	50	100	200	500
Starting to measure	bar (abs.)	0					
Fundamental resonance frequency of membrane	kHz	12	16	29	60	86	134
Attenuation ratio of membrane	1	0.01					
Operating range at 23°C	%	0...150					
Overload cutoff at 23°C	%	175					
Test pressure	%	175					
Destructive range	%	>200					
With dynamic loading							
permitted pressure	%	100					
permitted oscillation bandwidth (in accordance with DIN 50 100)	%	70	70	85	95	95	60
Material for parts in contact with the measurement medium:							
internal surfaces		Stainless steel 1.4542					
pressure connector (tube)		Stainless steel 1.4301					
Material for external surfaces		Stainless steel 1.4301					
		Polythene					
Dead volume with tube, without pressure connector	mm ³	1110 (410)	1100 (400)	1090 (390)	1060 (360)	1100 (400)	1020 (320)
Control volume	mm ³	2			1.5	0.5	0.3
Output characteristics							
Rated sensitivity	mV/V	2 ± 2%					
Input resistance	Ω	420 (+180/-120)				370 (+130/-70)	
Output resistance	Ω	330 (+90/-30)					
Rated range of the excitation voltage (effective value)	V	0.5...5		0.5...12			
Characteristic curve deviation (Starting point setting)	%	0.3					
Repeatability in accordance with DIN 1319	%	±0.1					
Temperature coefficient of zero point, by reference to measurement span, per 10K, in rated temperature range	%	0.3	0.2				
Temperature coefficient of sensitivity (measurement span), by reference to the actual value, per 10K, in rated temperature range	%	±0.3					

Ambient conditions		
Rated temperature range	°C	-10...+70
Service temperature range	°C	-40...+80
Storage temperature range	°C	-50...+85
Impact resistance (in accordance with DIN IEC 68)	m/s ²	800
Protection System (in accordance with DIN 40050, IEC 68)		IP67
Weight (without cable) approx.	g	40

6 Dimensions



Threaded connector in accordance with selection list

7 Options

Option 1: Combinable measuring range and pressure connector

The following pressure connectors may be used in combination with the final scale values listed in the Technical Data:

External thread:

M10x1; M20x1.5; G1/2 Form D; G1/2 Form B; G1/4 Form B

Internal thread:

G1/4 Form Z; NPT1/4; M8x1.25

Also: tube D10

Option 2: Ex-i version

EEx ib IIC T4 for ranges:

100bar, 200bar, 500bar,

Ranges 10bar to 50bar with restricted test voltage 200V_{AC}, high-temperature version (-40°C...+140°C service temperature range)

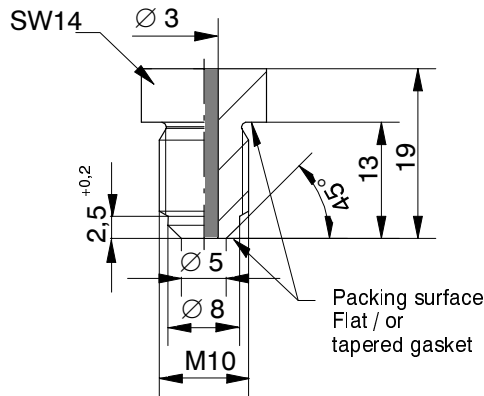
	M10 x 1	G1/2 Form D	M20 x 1.5	G1/4 Form B	G1/2 Form B	G1/4 Form Z	M8 x 1.25	NPT1/4	Tube
Dead volume ²⁾ (mm ³)	170	260	260	190	260	100	180	800	700
Final scale value (bar)	500	1600 ¹⁾	1600 ¹⁾	1000	1600 ¹⁾	1000 ¹⁾	500	1000	500
Material	1.4542	1.4542	1.4542	1.4542	1.4542	1.4542	1.4542	1.4542	1.4571

1) Specifications in accordance with DIN 16 288

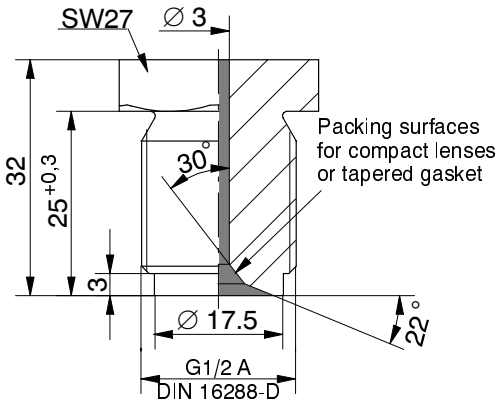
2) Dead volume of connector element, to be added to dead volume of transducer

Dimensions of connector elements with external thread

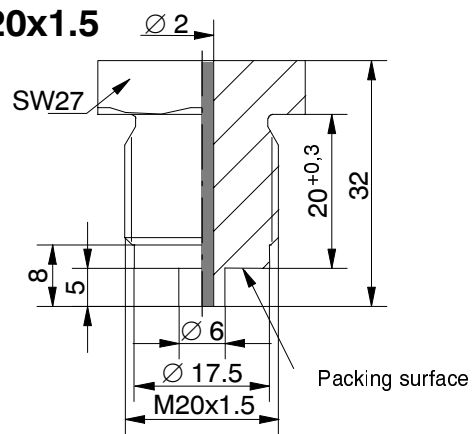
M10x1



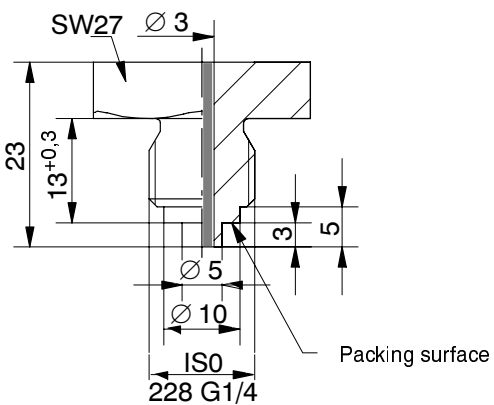
G1 Form D



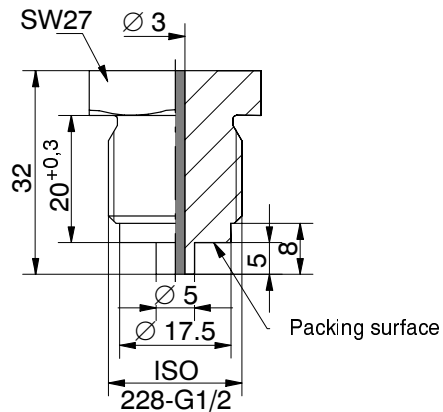
M20x1.5



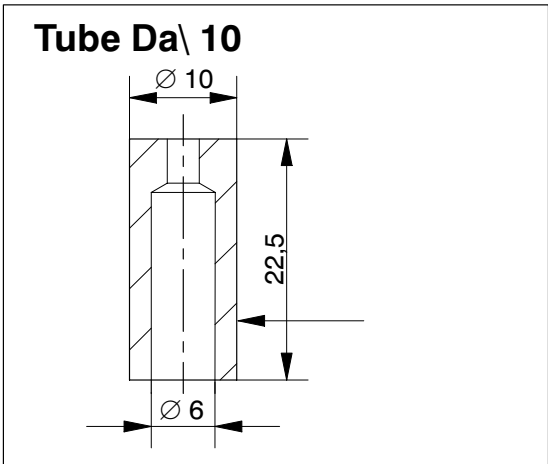
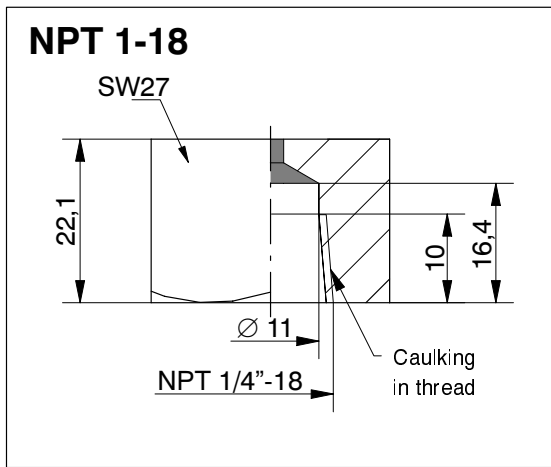
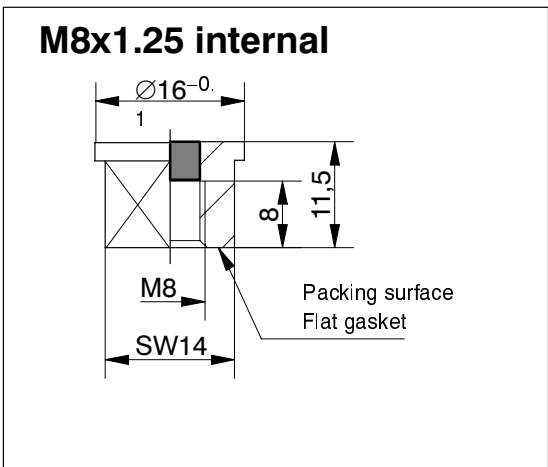
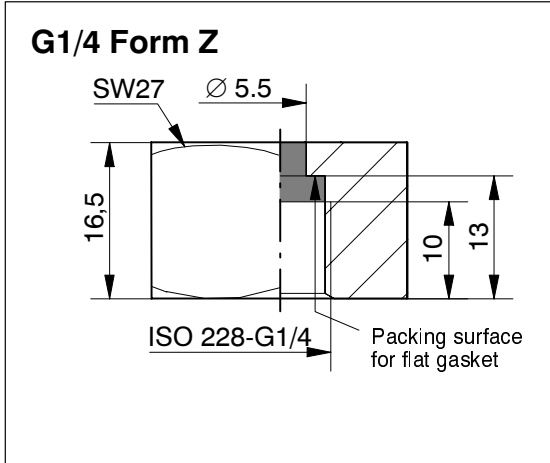
G1 Form B



G1 Form B



Dimensions of connector elements with internal thread



8 Copy of Declaration of Conformity



**HOTTINGER
BALDWIN
MESSTECHNIK**

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: 042/04.1995

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

Druckaufnehmer der Typenreihe P8

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

73/23/EWG - Richtlinie des Rates vom 19. Februar 1973 zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen, geändert durch 93/68/EWG

Die Absicherung aller produkt-spezifischen 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 sicherheits-relevanten 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, 18.5.95

Seite 2 zu

Page 2 of

Page 2 du

Document: **042/04.1995**

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 50082-1 : 1992

Elektromagnetische Verträglichkeit (EMV); Fachgrundnorm Störfestigkeit; Teil 1: Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe; Deutsche Fassung

prEN 50082-2 : 1992

Elektromagnetische Verträglichkeit (EMV); Fachgrundnorm Störfestigkeit; Teil 2: Industriebereich; Deutsche Fassung



HOTTINGER BALDWIN MESSTECHNIK 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
www.hbm.de

Modifications reserved.
All details describe our products in general form only. They are not to be understood as express warranty and do not constitute any liability whatsoever.

im-d11.97-Opod-e