

# Euro gauge

## Inductive contact type diaphragm pressure gauge

### Model: P501, P502 series

Spec. sheet no. PD05-02

#### Service intended

P501 and P502 series are designed for a local reading of measured pressure and equipped with the inductive contact block which allows all the combinations of contact to be used. The contact block is mounted on the dial. The window is fitted with a knob for external adjustment of the setpoints.



#### Nominal diameter

100 and 160 mm

#### Accuracy

±1.0 % of full scale

#### Scale range (MPa, kPa, bar)

0 ~ 1 kPa to 0 ~ 40 kPa (Flange 150 mm)

0 ~ 50 kPa to 0 ~ 2.5 MPa (Flange 100 mm)

#### Working pressure

Steady : Full scale value

Fluctuating : 90 % of full scale value

#### Working temperature

Ambient : -20 ~ 65 °C

Fluid : Max. 100 °C

#### Degree of protection

EN60529/IEC529/IP67

#### Temperature effect

Accuracy at temperature above and below the reference temperature (20 °C) will be effected by approximately ±0.4 % per 10 °C of full scale



### Standard features

#### Pressure connection and under flange

Material : 304SS, 316SS and 316L SS

#### Upper flange (Gauge side)

Material : 304SS, 316SS

#### Diaphragm material

≤40 kPa Stainless steel (316Ti SS)

>40 kPa Duratherm 600

#### Case

Stainless steel (304SS)

#### Cover

Stainless steel (304SS)

Bayonet type

#### Window

Safety glass : Only available with diameter 100 mm

Polycarbonate : 100 and 160 mm

#### Movement

Stainless steel

#### Dial

White aluminium with black graduations

#### Pointer

Black painted aluminium alloy

#### Conduit connection

M20 x 1.5

#### Certificates

NEPSI Ex ia IIC T6 Ga

KCS Ex ia IIC T6

Tamb = -25 ~ 56 °C

#### Option

External zero adjustable

**WISE**<sup>®</sup>

**1. Base model**

- P501** Screwed process connection  
**P502** "I" type flange process connection

**2. Nominal diameter and window material**

- 4** 100 mm and safety glass  
**5** 100 mm and polycarbonate window  
**6** 160 mm and polycarbonate window

**3. Type of mounting**

- A** Bottom entry

**4. Contact function**

- 1** High alarm, normal open contact  
**2** Low and High alarm  
**3** Low alarm, normal close contact  
**4** Two high alarm  
**5** Two low alarm  
**6** Failsafe high and low alarm

**5. Process connection**

- XX** Refer to connection type table

**6. Under flange material (Wetted parts)**

- BX** 304SS  
**CX** 316SS  
**EX** 316L SS

**7. Unit**

- H** bar  
**I** MPa  
**J** kPa  
**S** mbar

**8. Range**

- XXX** Refer to pressure unit and range table

**9. Liquid filling**

- 0** None

**10. Option**

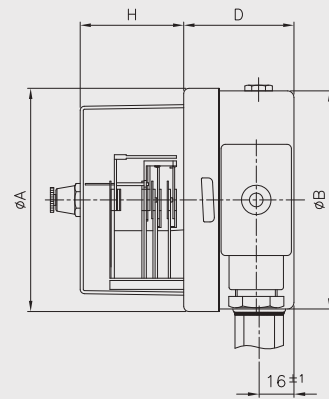
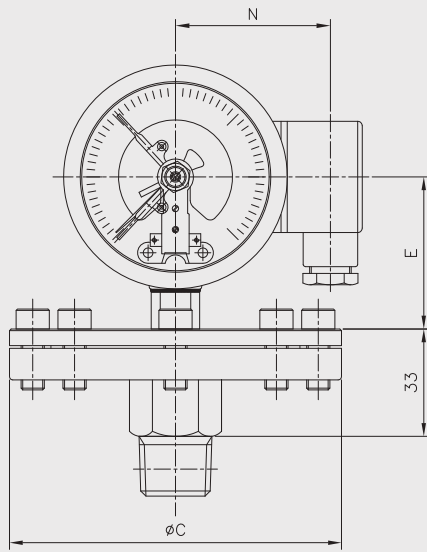
- 0** None  
**1** Amplifier (AC 230 V)

**Sample ordering code**

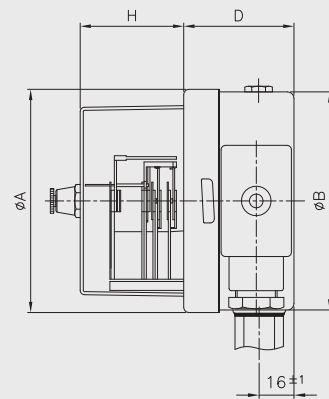
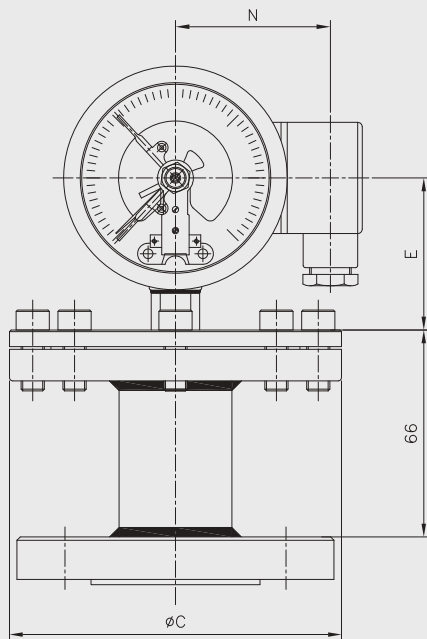
1	2	3	4	5	6	7	8	9	10
P501	4	A	3	XX	BX	H	XXX	0	0

## P501, P502 : Type of mounting (Polycarbonate window 1/2)

P501



P502

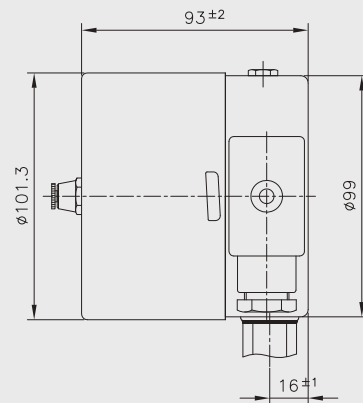
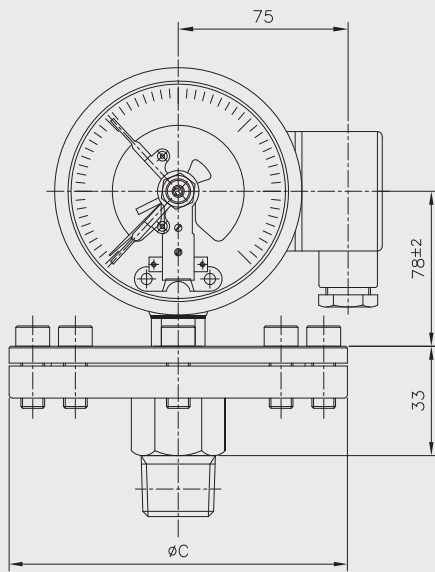


Dimensions (mm)

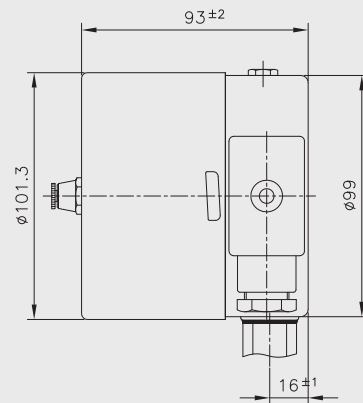
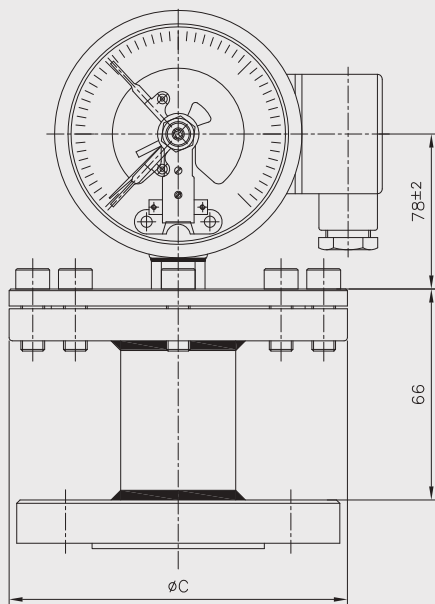
Dial size	A	B	D±2	E±2	H	N	C	
							≤ 40kPa	> 40kPa
100	101.3	99	50	78	34.5	75	150	100
160	160.6	159	52.5	108	34	105	150	100

## P501, P502 : Type of mounting (Safety glass window 2/2)

P501



P502



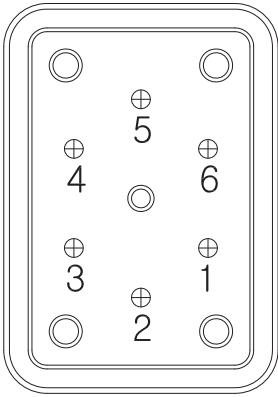
Dimensions (mm)

Dial size	C	
	≤ 40kPa	> 40kPa
100	150	100

## Contact function table

Code	Wiring scheme	Contact function		Wiebrock code no.	Slot sensor	
		1 <sup>st</sup> contact	2 <sup>nd</sup> contact			
<b>Single contact</b>						
<b>1</b>	Control vane inside the slot sensor - Contact make (Normal open)				I-1	SJ2N for 100 mm SJ3.5N for 160 mm
<b>3</b>	Control vane out of the slot sensor - Contact break (Normal close)				I-2	SJ2N for 100 mm SJ3.5N for 160 mm
<b>Double contact</b>						
<b>4</b>	1 <sup>st</sup> and 2 <sup>nd</sup> Control vane inside the slot sensor - 1 <sup>st</sup> and 2 <sup>nd</sup> Contact make	1 <sup>st</sup>  2 <sup>nd</sup> 			I-11	SJ2N for 100 mm SJ3.5N for 160 mm
<b>6</b>	1 <sup>st</sup> Control vane inside and 2 <sup>nd</sup> control vane out of the slot sensor - 1 <sup>st</sup> Contact make 2 <sup>nd</sup> Contact break	1 <sup>st</sup>  2 <sup>nd</sup> 			I-12	SJ2N for 100 mm SJ3.5N for 160 mm Failsafe contact
<b>2</b>	1 <sup>st</sup> Control vane out of the vane and 2 <sup>nd</sup> control vane inside of the vane - 1 <sup>st</sup> Contact break 2 <sup>nd</sup> Contact make	1 <sup>st</sup>  2 <sup>nd</sup> 			I-21	SJ2N for 100 mm SJ3.5N for 160 mm
<b>5</b>	1 <sup>st</sup> and 2 <sup>nd</sup> Control vane out of the slot sensor - 1 <sup>st</sup> and 2 <sup>nd</sup> Contact break	 			I-22	SJ2N for 100 mm SJ3.5N for 160 mm

## Terminal block arrangement



### 1. High alarm (I-1)

- ① Normal open (+)
- ③ Common (-)
- ⑤ Ground

### 2. Low and high alarm (I-21)

#### Low alarm

- ① Normal close (+)
- ③ Common (-)
- ⑤ Ground

#### High alarm

- ④ Normal open (+)
- ⑥ Common (-)

### 3. Low alarm (I-2)

- ① Normal close (+)
- ③ Common (-)
- ⑤ Ground

### 4. Two high alarm (I-11)

#### No.1 High alarm

- ① Normal open (+)
- ③ Common (-)
- ⑤ Ground

#### No.2 High alarm

- ④ Normal open (+)
- ⑥ Common (-)

### 5. Two low alarm (I-22)

#### No.2 Low alarm

- ① Normal close (+)
- ③ Common (-)
- ⑤ Ground

#### No.1 Low alarm

- ④ Normal close (+)
- ⑥ Common (-)

### 6. Failsafe high and low alarm (I-12)

#### High alarm

- ① Normal open (+)
- ③ Common (-)
- ⑤ Ground

#### Low alarm

- ④ Normal close (+)
- ⑥ Common (-)

## Inductive alarm sensor model P500 series

### Service intended

WISE inductive contacts are certified for use in hazardous areas of zone 0.

power supply must be made by means of a power source certified intrinsically safe such as pepper and fucus model KFA6-SR2-Ex1.W

Inductive contact are also recommended for critical non-hazardous applications where an utmost of failsafe heavy duty operation is required.

In combination with liquid filled instruments these contacts are particularly suited for process control circuits in the chemical and petroleum industry.

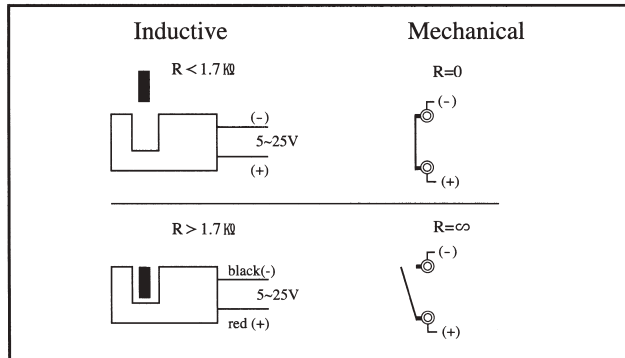
### Operating principle

At the heart of the WISE inductive contact system is a non-contact sensor attached to an pressure gauge. Both sensor and gauge are adjustable over the full length of the scale. Contact actuation is achieved by means of a Control vane linked to the pointer of the gauge.

The control vane affects the electric field of the sensor when the instruments pointer overlaps with the contacts indicator.

Contact actuation is made without any mechanical force that would affect accuracy of the gauge.

The scheme below reflects the operating principle in comparison with conventional mechanical contacts :



Dimensions of the basic instrument and provisions for contacts adjustment are identical to contacts of model P500.

Operating temperature: -25 °C... +70 °C

Used sensor (slot-type initiator) :

Type SJ of the company Pepper and Fuchs,

EC-type-examination certificate PTB 99 ATEX 2219 X

## Advantage of the WISE inductive system

- Long service life by means of non-contact sensor
- Very little effect on gauge accuracy
- No reduced rating with liquid filled gauges
- Fully suitable in corrosive or hazardous atmosphere
- Ex-approved for service in hazardous area of zone 1 or 2

## Components of the WISE inductive contact system

Operation of the inductive contact system requires an appropriate electronic power supply and control unit.

The Safety Barrier consists of

- Line transformer
- Amplifier circuit
- Relay to switch external circuit

The isolated line transformer provides for power supply whereas the amplifier conditions the signal of the inductive sensor to energise the output relay.

Available are two versions of control units

- Ex-approved intrinsic safety
- Standard for non-intrinsically safe version (optional)

## Safety barrier for inductive contacts

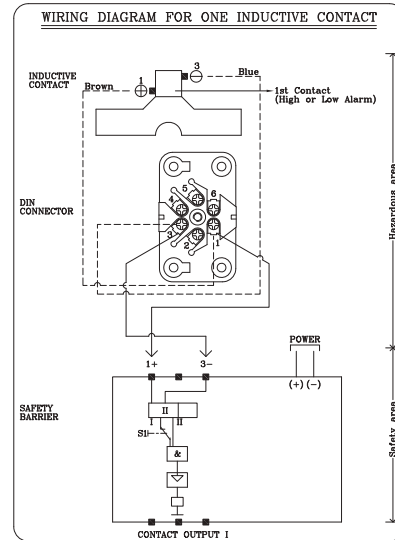
### Ex-certified versions

### Safety barrier model KFA6-SR2-Ex1.W

- Intended for instruments having one inductive contact incorporated
- Alarm circuit certified intrinsically safe [EEx id] IIC to EN 50 227 and NAMUR
- Provides 1 SPDT relay output contact
- LED indicating circuit status (green), relay output (yellow) and lead breakage (red)
- Case surface mounting type Form A

#### Note

Directions of action adjustable by sliding switch S1 :  
 Open circuit causes alarm : Switch S1 in position I  
 Closed circuit causes alarm : Switch S1 in position II



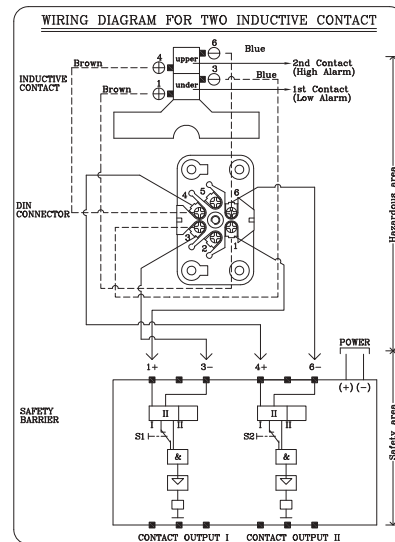
SAFETY BARRIER MODEL	Contact Output I (High or Low Alarm)	POWER
KFA5-SR2-Ex1.W(115V, AC)	7(COMMON) 8(OPEN) 9(CLOSE)	14(+) 15(-)
KFA6-SR2-Ex1.W(230V, AC)		
KFD2-SR2-Ex1.W(24V.DC)		

### Safety barrier model KFA6-SR2-Ex2.W

- Intended for 1 instrument having two or two instruments having one each contact incorporated
- Alarm circuit certified intrinsically safe [EEx id] IIC to EN 50 227 and NAMUR
- Provides 2 SPDT relay output contacts
- LED indicating circuit status (green), 2 x relay output (yellow) and 2 x lead breakage (red)
- Case surface mounting type Form B

#### Note

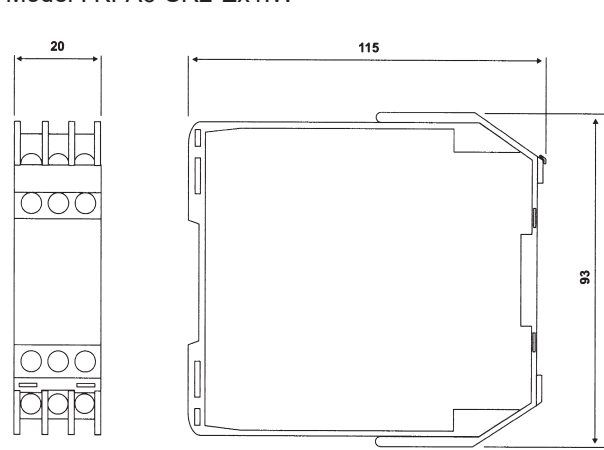
Directions of action adjustable by sliding switch S1 and S2 :  
 Open circuit causes alarm : switch S1 and S2 in position I  
 Closed circuit causes alarm : switch S1 and S2 in position II



SAFETY BARRIER MODEL	Contact Output I (Low Alarm)	Contact Output II (High Alarm)	POWER
KFA5-SR2-Ex2.W(115V, AC)	7(COMMON) 8(OPEN) 9(CLOSE)	10(COMMON) 11(OPEN) 12(CLOSE)	14(+) 15(-)
KFA6-SR2-Ex2.W(230V, AC)			
KFD2-SR2-Ex2.W(24V.DC)			

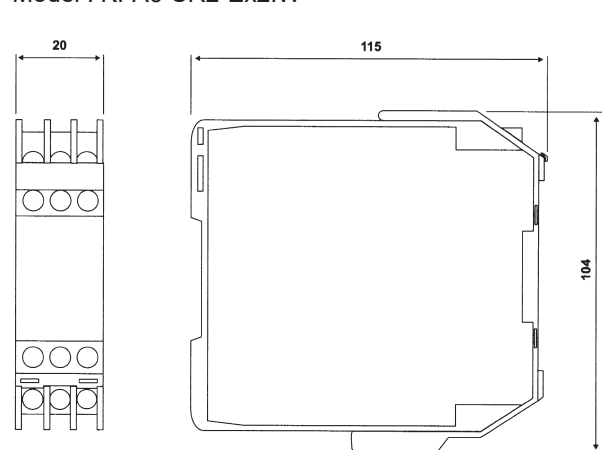
## Dimensions of safety barrier for inductive contact

Model : KFA6-SR2-Ex1.W



Form A

Model : KFA6-SR2-Ex2.W



Form B

Specifications for safety barrier	Model KFA6-SR2-Ex1.W	Model KFA6-SR2-Ex2.W
<b>Power supply</b>		
Line voltage 1)	AC 230 V ±0 %, 45...65 Hz	AC 230 V±0 %, 45...65 Hz
Consumption	1 VA	1.3 VA
<b>Input</b>		
No. of contacts	1	2
Voltage (reactive)	DC 8 V	DC 8 V
Maximum current	8 mA	8 mA
Contact actuation	$1.2 \text{ mA} \leq I_s \leq 2.1 \text{ mA}$	$1.2 \text{ mA} \leq I_s \leq 2.1 \text{ mA}$
Contact hysteresis	ca. 0.2 mA	ca. 0.2 mA
Control line impedance	100 Ω	100 Ω
<b>Ex-IS data (as PTB-certified)</b>		
Voltage	$U_o \leq \text{DC } 10.6 \text{ V}$	$U_o \leq \text{DC } 10.6 \text{ V}$
Current	$I_o \leq 19.1 \text{ mA}$	$I_o \leq 19.1 \text{ mA}$
Power rating	$P_o \leq 51 \text{ mW}$	$P_o \leq 51 \text{ mW}$
IS-classification	[EEx ia] IIC	[EEx ia] IIC
Ext. capacitance	2.9 μF	2.9 μF
Ext. inductance	100 mH	100 mH
<b>Output</b>		
Relay contacts	1 SPDT	1 ea. SPDT
Contact rating AC	253 V, 2 A, 500 VA, $\cos\phi > 0.7$	253 V, 2 A, 500 VA, $\cos\phi > 0.7$
Contact rating DC	4 V, 2 A, ohmic	4 V, 2 A, ohmic
Delay making circuit	Approx. 20 ms	Approx. 20 ms
Delay breaking circuit	Approx. 20 ms	Approx. 20 ms
Max. on-off frequency	10 Hz	10 Hz
<b>Operating conditions</b>		
Min. temperature	-20 °C	-20 °C
Max. temperature	+60 °C	+60 °C
Max. humidity	Max. 75 %	Max. 75 %
Ingress protection	IP 20 (EN 60 529 / IEC529)	IP 20 (EN 60 529 / IEC529)
<b>Enclosure</b>		
Style	Surface mounting	Surface mounting
Dimensions per drawing	Form A	Form B
Mounting	Snap-fit on 35 mm X 7.5 mm (EN 50 022) rail. direct mounting feasible	
<b>Weight</b>	Approx. 0.15 kg	Approx. 0.15 kg

## Pressure unit and range table

Range and code	Unit and code				Diaphragm material	
	J : kPa	S : mbar	H : bar	I : MPa		
797	0 ~ 1	0 ~ 10	X	X	316Ti (130Ø)	
817	0 ~ 2.5	0 ~ 25	X	X		
826	0 ~ 4	0 ~ 40	X	X		
828	0 ~ 5	0 ~ 50	X	X		
830	0 ~ 6	0 ~ 60	X	X		
792	0 ~ 10	0 ~ 100	X	X		
810	0 ~ 16	0 ~ 160	X	X		
793	0 ~ 20	0 ~ 200	X	X		
818	0 ~ 25	0 ~ 250	X	X		
820	0 ~ 30	0 ~ 300	X	X		
130	0 ~ 40	0 ~ 400	0 ~ 0.4	X		
040	0 ~ 50	0 ~ 500	0 ~ 0.5	X		Duratherm 600 (75Ø)
131	0 ~ 60	0 ~ 600	0 ~ 0.6	X		
041	X	X	0 ~ 1	0 ~ 0.1		
042	X	X	0 ~ 2	0 ~ 0.2		
134	X	X	0 ~ 2.5	0 ~ 0.25		
043	X	X	0 ~ 3	0 ~ 0.3		
045	X	X	0 ~ 6	0 ~ 0.6		
143	X	X	0 ~ 16	0 ~ 1.6		
052	X	X	0 ~ 25	0 ~ 2.5		

O : Available X : Not available

## Process connection type table

8 <sup>th</sup> character		9 <sup>th</sup> , 10 <sup>th</sup> character			
Code	Connection size	For model P501		For model P502	
		Code	Connection type	Code	Flange rating
C *	1/4" (8A)	PF	PF	C	B16.5 Class 150 FF
D *	3/8" (10A)	AB	PT	B	B16.5 Class 150 RF
E	1/2" (15A)	AA	NPT	D	B16.5 Class 150 RFSF
F	3/4" (20A)	FF	BSPT	1	B16.5 Class 150 RTJ
G	1" (25A)	GG	BSPF	F	B16.5 Class 300 FF
H	1 1/4" (32A)	HH	NPS	E	B16.5 Class 300 RF
J	1 1/2" (40A)	JJ	M	G	B16.5 Class 300 RFSF
K	2" (50A)			2	B16.5 Class 300 RTJ
L	2 1/2" (65A)			J	B16.5 Class 600 FF
M	3" (80A)			H	B16.5 Class 600 RF
N	4" (100A)			K	B16.5 Class 600 RFSF
Z	Other			3	B16.5 Class 600 RTJ
				V	B16.5 Class 900 RF
				M	JIS 10K FF
				L	JIS 10K RF
				N	JIS 10K RFSF
				Q	JIS 20K FF
				P	JIS 20K RF
				R	JIS 20K RFSF
				T	JIS 30K FF
				S	JIS 30K RF
				U	JIS 30K RFSF
				X	JIS 40K FF
				W	JIS 40K RF
				I	JIS 5K FF
				A	JIS 5K RF
				Z	Other

\* Code C and D, only available with model P501