





## INSTALLATION, SERVICE AND MAINTENANCE

Pressure reducing valves VO(E)5 can be installed in any working position. Dimensions, quality and recommended class of fixing bolts is specified in the following table.

Type	Screw size and quantity	Torque [Nm]
VO(E)5 - 10...1	M10x60 DIN912-8.8 (4 pcs)	32
VO(E)5 - 10...2	M12x30 DIN912-8.8 (4 pcs)	52
VO(E)5 - 20...1	M10x40 DIN912-8.8 (4 pcs)	32
VO(E)5 - 20...2	M16x40 DIN912-8.8 (4 pcs)	112

Flatness deviation and surface roughness of the mounting surface shall not exceed 0.01/100 mm and Ra = 1.6 µm. It is required that the contact surfaces must be intact before installation. All "O"-rings must not be disshaped and damaged by any means. Adjustment of reduced outlet pressure is carried out by adjusting screw (with handwheel) and loosening jam nut. When the pressure is adjusted the adjusting screw must be locked by jam nut against loosening. Reliability of the valve is conditional upon use of prescribed working fluid, especially its temperature and purity.

## DELIVERY

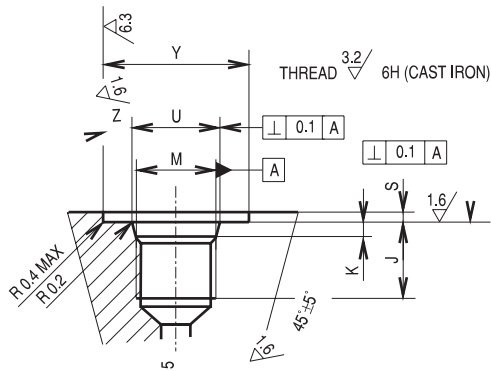
Pressure reducing valves VO(E)5 are delivered assembled with "O"-rings on the contact surface. Spare parts and mounting screws are not included in the package. These must be ordered separately.

## TECHNICAL DATA

Technical data	Symbol	Unit	VO5 - 10...1 VO5 - 10...2	VO5 - 20...1 VO5 - 20...2
Nominal size	Dn	mm	10	20
Max. input pressure	p <sub>MAX</sub>	MPa	32	32
Max. flow	Q <sub>MAX</sub>	dm <sup>3</sup> /min	100	200
Pressure ranges		MPa	6.3; 16; 32	
Max. pressure in port B	p <sub>MAX,B</sub>	MPa	32	
Max. pressure in port Y (type VOE)	p <sub>MAX,Y</sub>	MPa	6.3	
Recommended hydraulic fluid	Hydraulic oils of power classes (HL, HLP) according to DIN 51524			
Hydraulic fluid viscosity range	ν	mm <sup>2</sup> /s	10 ... 400	
Ambient temperature range	t <sub>A</sub>	°C	-20 ... +70	
Ambient temperature range (type VOE)	t <sub>A</sub>	°C	-20 ... +40	
Hydraulic fluid temperature range	t <sub>PO</sub>	°C	-20 ... +80	
Hydraulic fluid temperature range (type VOE)	t <sub>PO</sub>	°C	-20 ... +70	
Maximum degree of fluid contamination	Class 21/18/15 according to ISO 4406 (1999)			

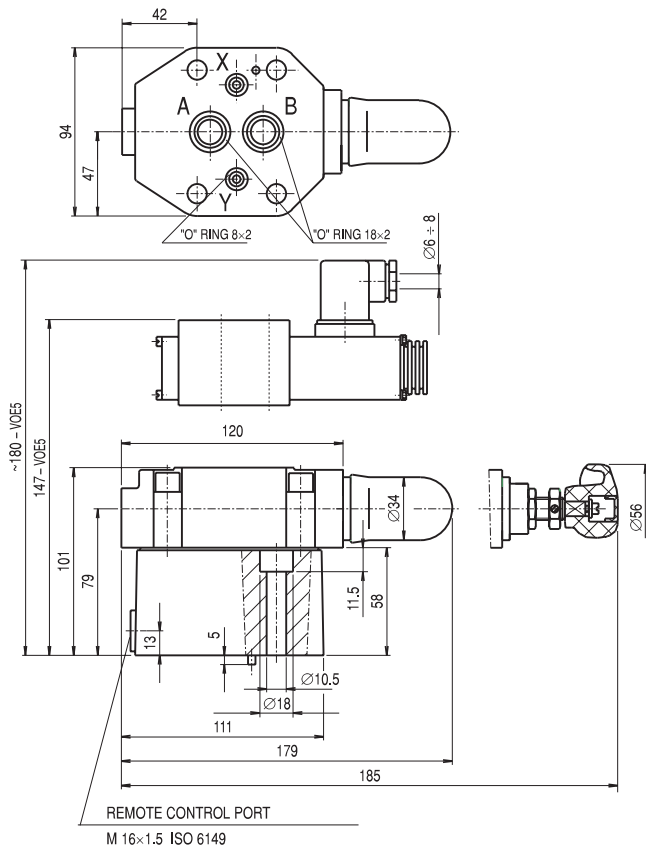
Type	VO5 - 10...1	VOE5 - 10...1	VO5 - 20...1	VOE5 - 20...1
Weight [kg]	4.6	5.8	4.85	6.05
Type	VO5 - 10...2	VOE5 - 10...2	VO5 - 20...2	VOE5 - 20...2
Weight [kg]	3.6	4.75	4.6	5.75

Electrical data	Symbol	Unit	110V AC   230V AC	24V DC
Nominal frequency	f	Hz	50	
Voltage fluctuation		%	±10	±10
Nominal current	I	A	0.23   0.16	0.8
Enclosure type according to EN 60 529		MPa	IP 65	

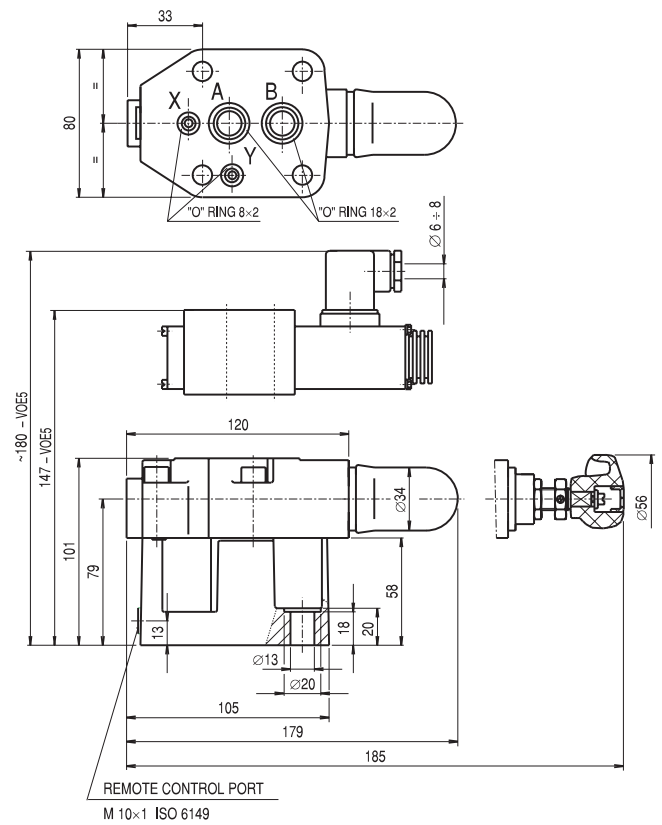
**REMOTE CONTROL PORT (PORT X)**


all dimensions in [mm]

M	J <sub>min</sub>	K	S <sub>max</sub>	U	Y <sub>min</sub>	Z
M16×1.5	13	2.4 <sup>+0.4</sup> <sub>-0.0</sub>	1.5	17.8 <sup>+0.1</sup> <sub>-0.0</sub>	27	15°±1°
M10×1	10	1.6 <sup>+0.4</sup> <sub>-0.0</sub>	1	11.1 <sup>+0.1</sup> <sub>-0.0</sub>	20	12°±1°

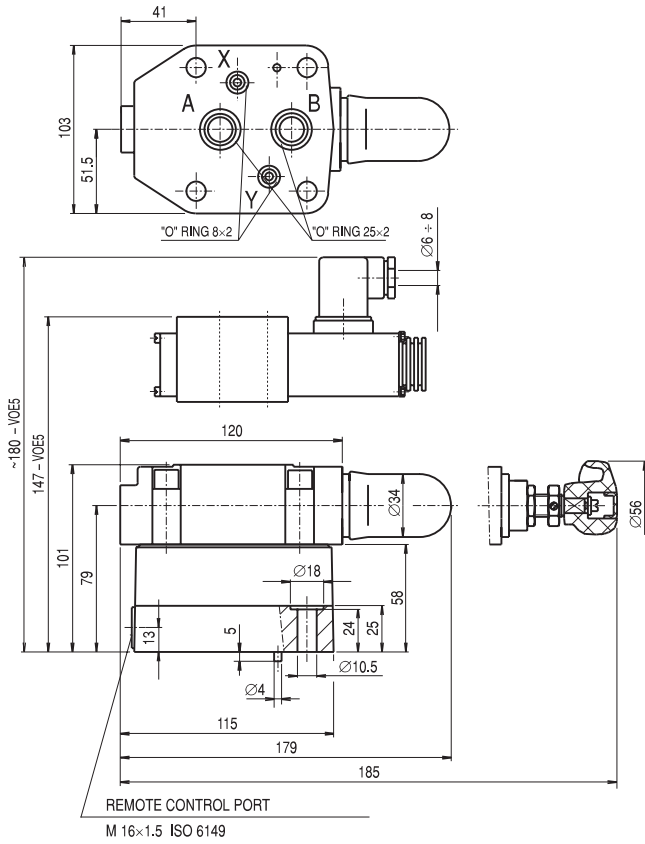
**DIMENSIONS**
**VO(E)5 - 10...1**

**VO(E)5 - 10...2**

all dimensions in [mm]



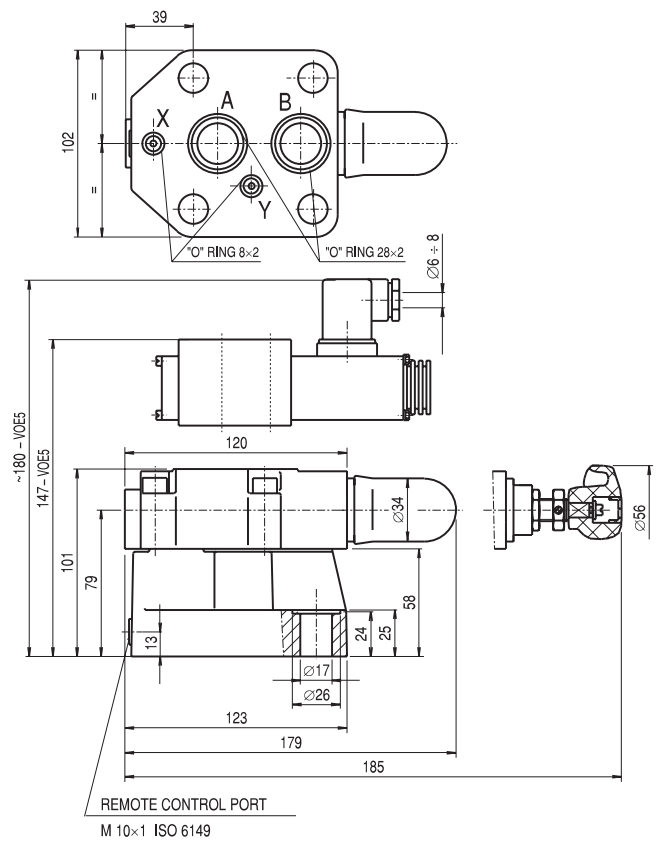
## DIMENSIONS

### VO(E)5 - 20...1



### VO(E)5 - 20...2

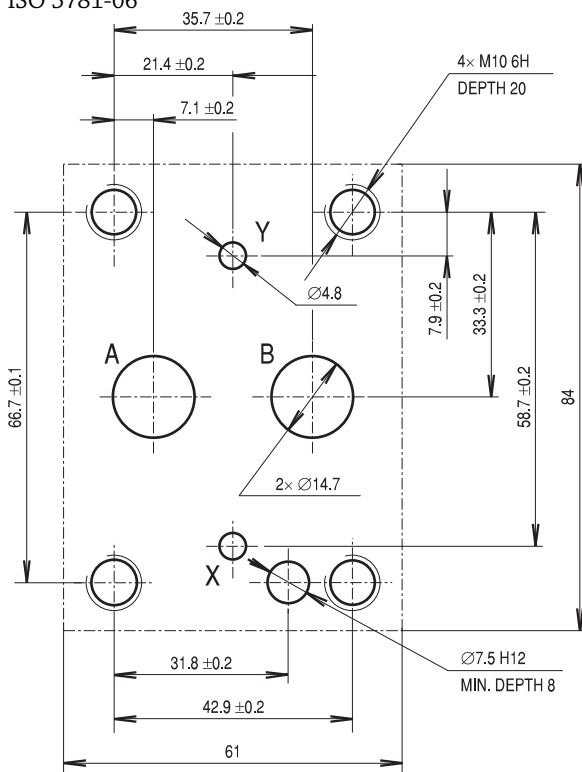
all dimensions in [mm]



## INSTALLATION DIMENSIONS

### VO(E)5 - 10...1

According to DIN 24 340, Form D  
ISO 5781-06

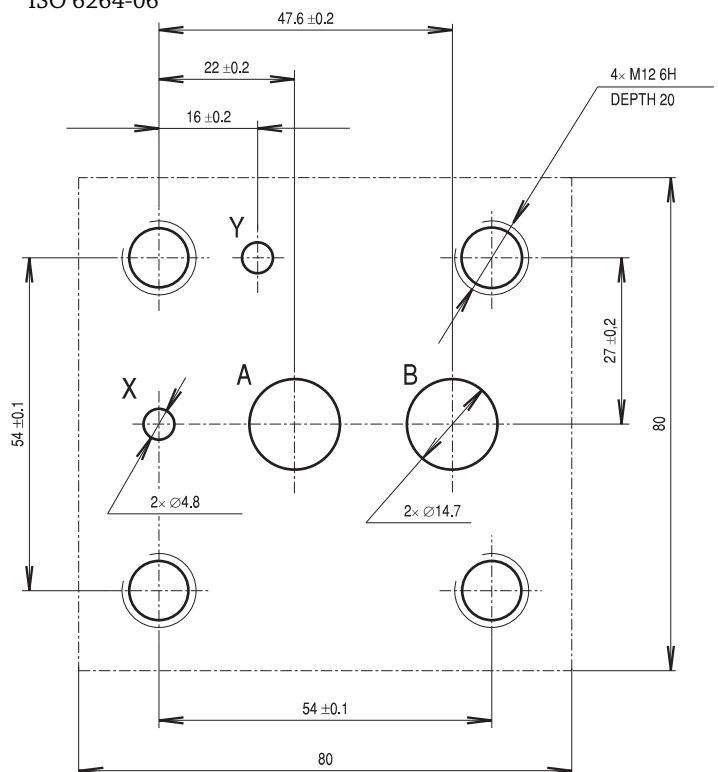


### VO(E)5 - 10...2

According to DIN 24 340, Form E  
ISO 6264-06

all dimensions in [mm]

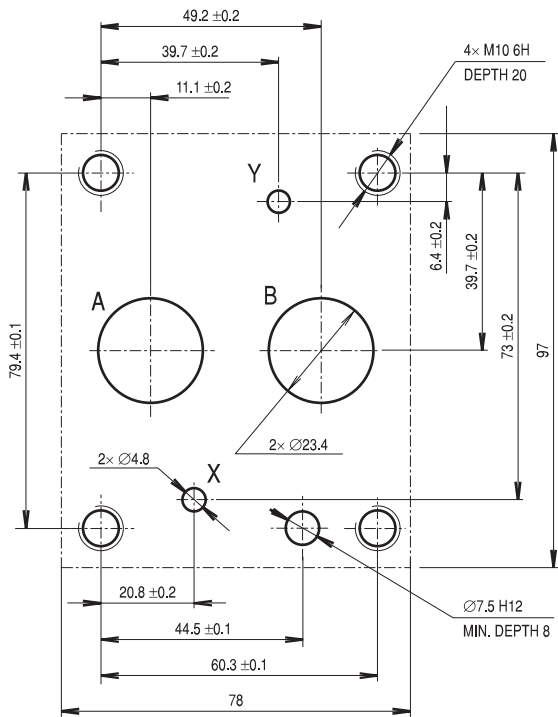
view towards panel



## INSTALLATION DIMENSIONS

### VO(E)5 - 20...1

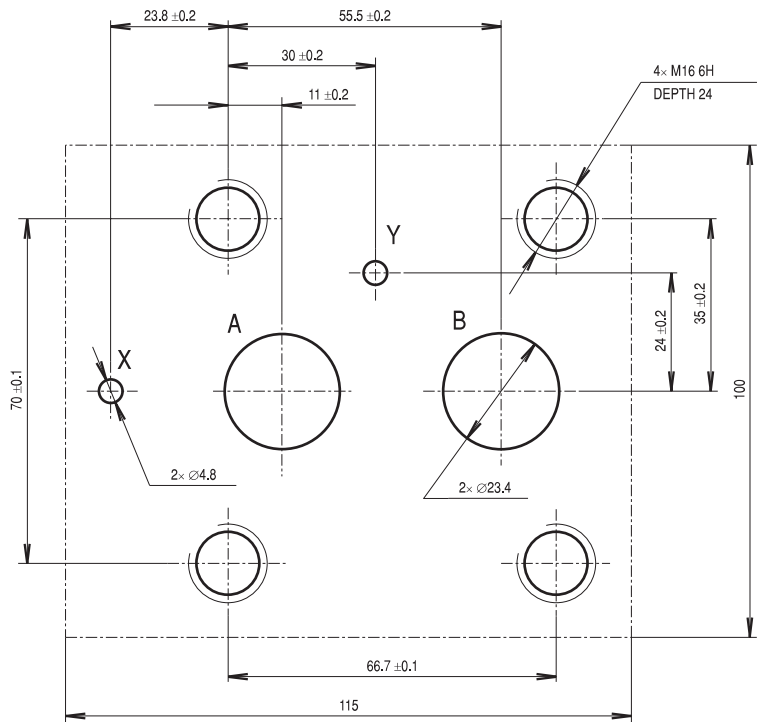
According to DIN 24 340, Form D  
ISO 5781-08



### VO(E)5 - 20...2

According to DIN 24 340, Form E  
ISO 6264-08

all dimensions in [mm]  
view towards panel

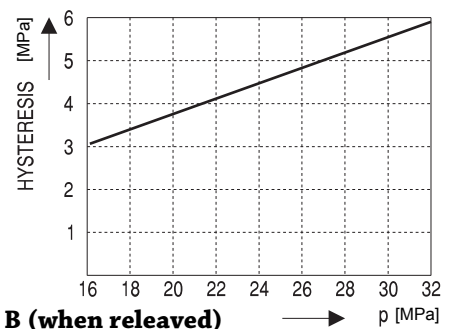
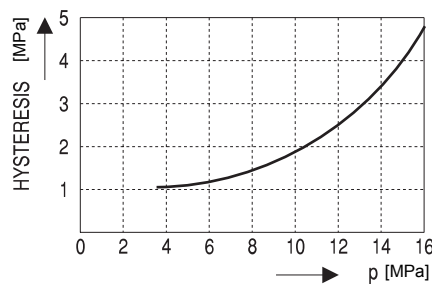
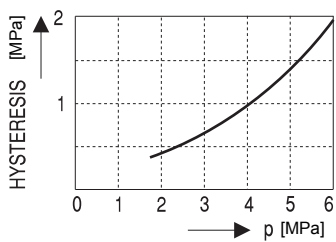


## HYSTERESIS

Pressure range: up to 6.3MPa

Pressure range: up to 16MPa

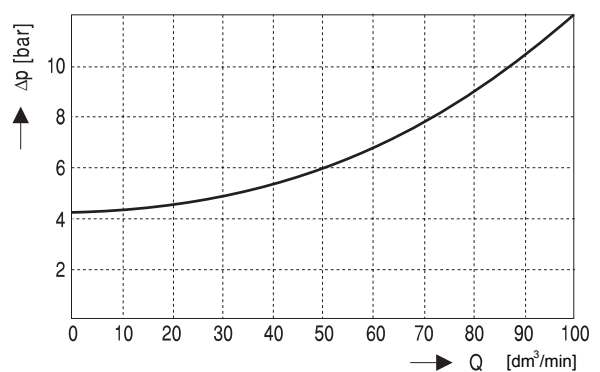
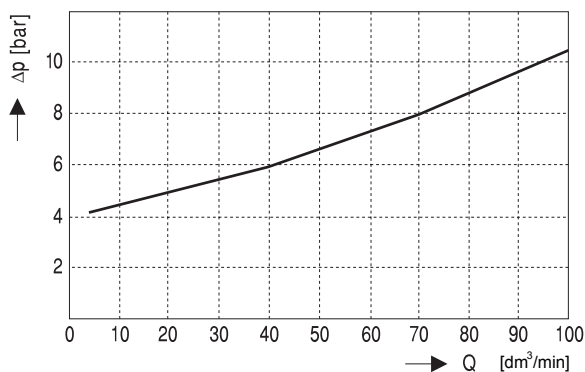
Pressure range: up to 32MPa



## PRESSURE DROP $\Delta p = f(Q)$

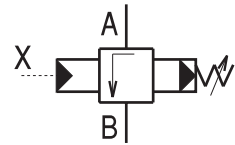
Dn 10, A → B (when released)

Dn 20, A → B (when released)

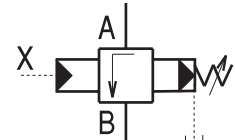


## TYPE AND SYMBOLS

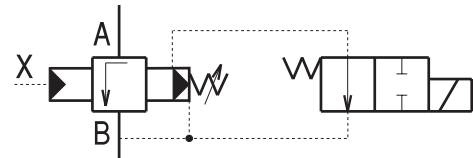
VO5-10/06-1-	VO5-20/06-1-
VO5-10/16-1-	VO5-20/16-1-
VO5-10/32-1-	VO5-20/32-1-
VO5-10/06-2-	VO5-20/06-2-
VO5-10/16-2-	VO5-20/16-2-
VO5-10/32-2-	VO5-20/32-2-



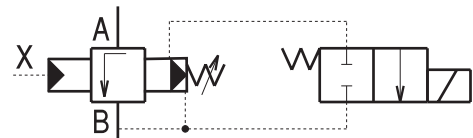
VO5-10/06-1Y-	VO5-20/06-1Y-
VO5-10/16-1Y-	VO5-20/16-1Y-
VO5-10/32-1Y-	VO5-20/32-1Y-
VO5-10/06-2Y-	VO5-20/06-2Y-
VO5-10/16-2Y-	VO5-20/16-2Y-
VO5-10/32-2Y-	VO5-20/32-2Y-



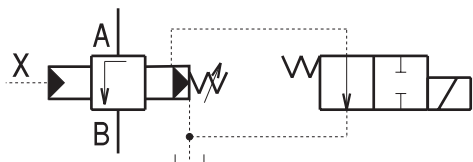
VOE5-10/06-1-P110U-	VOE5-20/06-1-P110U-
VOE5-10/16-1-P110U-	VOE5-20/16-1-P110U-
VOE5-10/32-1-P110U-	VOE5-20/32-1-P110U-
VOE5-10/06-1-P220U-	VOE5-20/06-1-P220U-
VOE5-10/16-1-P220U-	VOE5-20/16-1-P220U-
VOE5-10/32-1-P220U-	VOE5-20/32-1-P220U-
VOE5-10/06-1-P024S-	VOE5-20/06-1-P024S-
VOE5-10/16-1-P024S-	VOE5-20/16-1-P024S-
VOE5-10/32-1-P024S-	VOE5-20/32-1-P024S-



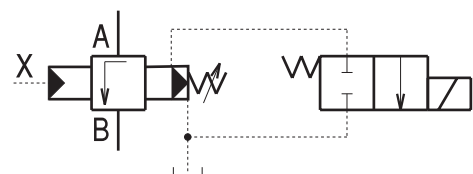
VOE5-10/06-1-N110U-	VOE5-20/06-1-N110U-
VOE5-10/16-1-N110U-	VOE5-20/16-1-N110U-
VOE5-10/32-1-N110U-	VOE5-20/32-1-N110U-
VOE5-10/06-1-N220U-	VOE5-20/06-1-N220U-
VOE5-10/16-1-N220U-	VOE5-20/16-1-N220U-
VOE5-10/32-1-N220U-	VOE5-20/32-1-N220U-
VOE5-10/06-1-N024S-	VOE5-20/06-1-N024S-
VOE5-10/16-1-N024S-	VOE5-20/16-1-N024S-
VOE5-10/32-1-N024S-	VOE5-20/32-1-N024S-



VOE5-10/06-1Y-P110U-	VOE5-20/06-1Y-P110U-
VOE5-10/16-1Y-P110U-	VOE5-20/16-1Y-P110U-
VOE5-10/32-1Y-P110U-	VOE5-20/32-1Y-P110U-
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VOE5-10/16-1Y-P220U-	VOE5-20/16-1Y-P220U-
VOE5-10/32-1Y-P220U-	VOE5-20/32-1Y-P220U-
VOE5-10/06-1Y-P024S-	VOE5-20/06-1Y-P024S-
VOE5-10/16-1Y-P024S-	VOE5-20/16-1Y-P024S-
VOE5-10/32-1Y-P024S-	VOE5-20/32-1Y-P024S-



VOE5-10/06-1Y-N110U-	VOE5-20/06-1Y-N110U-
VOE5-10/16-1Y-N110U-	VOE5-20/16-1Y-N110U-
VOE5-10/32-1Y-N110U-	VOE5-20/32-1Y-N110U-
VOE5-10/06-1Y-N220U-	VOE5-20/06-1Y-N220U-
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VOE5-10/16-1Y-N024S-	VOE5-20/16-1Y-N024S-
VOE5-10/32-1Y-N024S-	VOE5-20/32-1Y-N024S-





**NOTES**



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