

# Hydraulic cylinder Tie rod design

RE 17047/11.03

1/8

## Type VBH

Nominal pressure 200 bar (20 Mpa)  
 Piston  $\varnothing$  25 to 125 mm  
 Piston rod  $\varnothing$  16 to 70 mm  
 4 mounting styles



17047.tif

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## Features

- Standards: CNOMO 05-07-65 to 05-07-70
- Standard stroke lengths from 5 to 160 mm
- Without end position cushioning
- 3 / 2 connections at cylinder head and base

## Ordering details

					<b>G</b>
<b>Design</b>					<b>G =</b>
Differential cylinder	= HVBS				Pipe thread to ISO 228/1
Differential cylinder with sensor rod	= HVBD				
<b>Piston Ø / Piston rod Ø in mm</b>		25 / 16 = <b>02</b>			
		32 / 18 = <b>03</b>			
		40 / 22 = <b>04</b>			
		50 / 28 = <b>05</b>			
		63 / 36 = <b>06</b>			
		80 / 45 = <b>08</b>			
		100 / 56 = <b>10</b>			
		125 / 70 = <b>12</b>			
<b>Stroke length (standard) in mm <sup>1)</sup></b>		5 = <b>A</b>			
		10 = <b>B</b>			
		16 = <b>C</b>			
		25 = <b>D</b>			
		40 = <b>E</b>			
		63 = <b>F</b>			
		100 = <b>G <sup>2)</sup></b>			
		160 = <b>H <sup>3)</sup></b>			
					<b>H =</b>
					<b>V <sup>5)</sup> =</b>
					<b>Seal version</b>
					Normal temperature
					High temperature
					<b>Mounting style + Piston rod end <sup>4)</sup></b>
					↓
					↓
					<b>1 =</b> Threads in cylinder head + Thread
					<b>2 =</b> Rectangular flange at head + Thread
					<b>3 =</b> Foot mounting at head + Thread
					<b>4 =</b> Self-aligning clevis at base + Thread
					<b>5 =</b> Threads in cylinder head + Spigot
					<b>6 =</b> Rectangular flange at head + Spigot
					<b>7 =</b> Foot mounting at head + Spigot
					<b>8 =</b> Self-aligning clevis at base + Spigot

<sup>1)</sup> Intermediates stroke with pressure limitation on request!

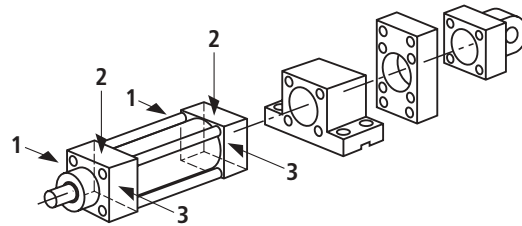
<sup>2)</sup> Only piston Ø 32 to 125 mm

<sup>3)</sup> Only piston Ø 40 to 125 mm

<sup>4)</sup> Other piston rod end versions on request!

<sup>5)</sup> Only for the HVBS version!

The HVBD is supplied as a special variant with V-seals (with the exception of the seals on the sensor rod), please consult ourselves.



The cylinders have, as standard, 3 or 2 pipe connections at the cylinder head and base, this is dependent on the mounting style. See table to the right.

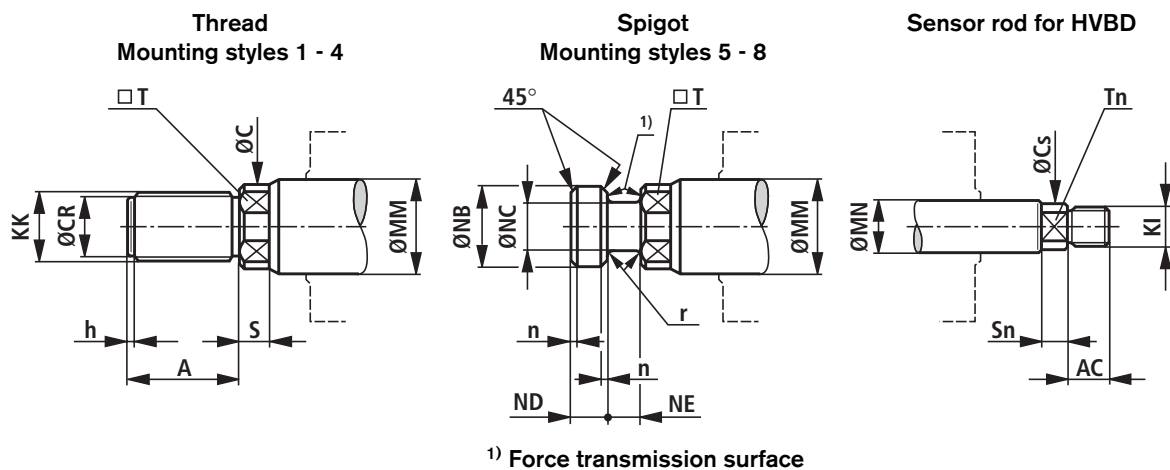
Orientation 2 is supplied, the other connections are plugged with easy to remove plugs.

Mounting style	Connection orientation	
	Head end	Base end
1, 2, 5, 6	2 + 3	1 + 2 + 3
4, 8	2 + 3	
3, 7	1 + 2 + 3	

This range of cylinders with their integrated mounts and no-end position cushioning are of a very short design and are therefore preferred for applications where the available installation space is very small, short strokes, low speed, low weight and low internal leakage for maintaining the pressure is required.

Example: Clamping devices, core ejectors or parts involved in mould manufacturing

## Piston rod ends (in mm)



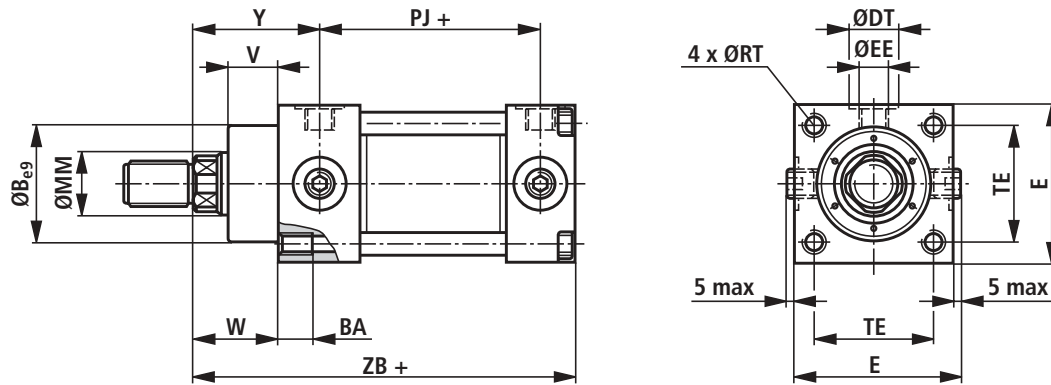
AL Ø	MM Ø	KK	A	CR	h	C	T	S	NB h13	NC h13	ND h13	NE H11	n	r	$p_{max}$ bar	MN	AC	KI	Cs	Sn	Tn
25	16	M12x1.25	20	9.5	2.5	14	12	8	14	8	6	6	0.2	0.3	180	10	10	M8x1.25	9.5	5	8
32	18	M12x1.25	20	9.5	2.5	15	13	8	15	9	6	6	0.2	0.3	115	10	10	M8x1.25	9.5	5	8
40	22	M16x1.5	25	13	3	19	17	8	18	11.2	8	8	0.2	0.5	125	12	12	M10x1.5	12	6	10
50	28	M20x1.5	32	17	3	25	22	8	22.4	14	10	10	0.2	0.5	115	12	12	M10x1.5	12	6	10
63	36	M27x2	40	23.5	3	33	30	12.5	28	18	12.5	12.5	0.3	0.8	130	12	12	M10x1.5	12	6	10
80	45	M33x2	50	29.5	3	42	36	12.5	35.5	22.4	16	16	0.3	0.8	110	12	12	M10x1.5	12	6	10
100	56	M42x2	63	38.5	5	53	46	14	45	28	20	20	0.5	1.2	125	16	16	M12x1.25	15	8	13
125	70	M56x2	80	48.5	5	67	60	14	56	35.5	25	25	0.5	1.2	115	16	16	M12x1.25	15	8	13

## Technical data (for applications outside these parameters, please consult us!)

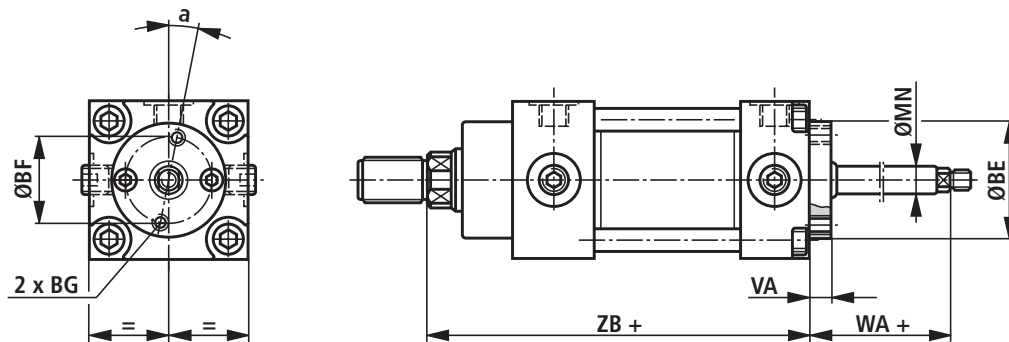
General			
Installation			Optional
Maximum stroke speed	$v_{max}$	m/s	0.2 for piston $\varnothing < 80$ m/s 0.1 for piston $\varnothing > 80$
Recommended maximum end stop velocity		mm/s	< 10
Stroke tolerance		mm	+2
Hydraulic			
Maximum operating pressure	$p_{max}$	bar	200 bar for standard strokes (cover attached by means of screws) with external threads; limited to 160 bar for intermediate strokes and tie rods (special version); for piston rod end spigots see dimension table
Pressure fluid temperature range	H-seals	°C	-20 to +80
	V-seals	°C	-20 to +160
Cleanliness class to ISO code			Maximum permissible degree of contamination of the pressure fluid is to ISO 4406 (C) class 20/18/15
Viscosity range		mm <sup>2</sup> /s	2.8 to 380

## Mounting styles 1 and 5: threads on cylinder head (in mm)

HVBS to CNOMO 05.07.66



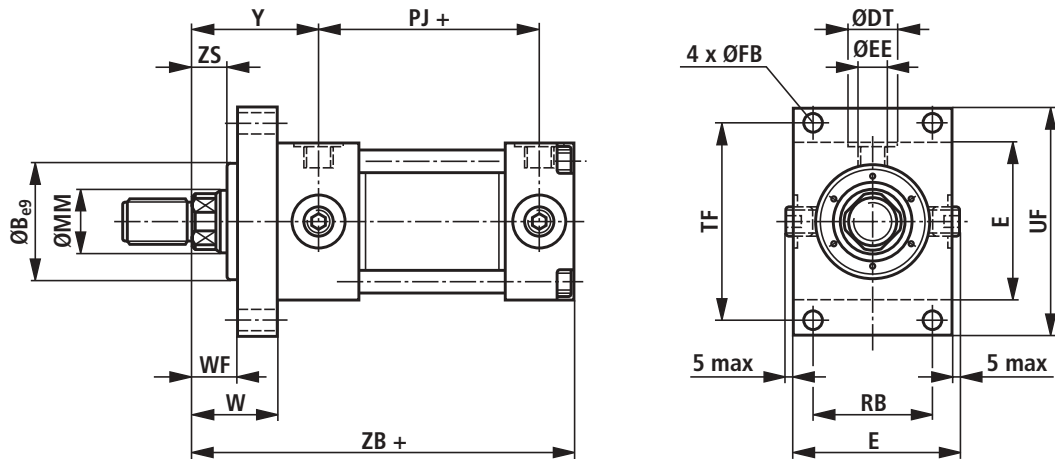
HVBD sensor rod to CNOMO 05.07.70



AL	MM	a	B	BA	BE	BF	BG	DT	E	EE	MN	PJ	RT	TE	V	VA	W	WA	Y	ZB
Ø	Ø		e9																	
25	16	-	36	12	36	25	M5	19	45	1/8	10	34	M6	34	16	8	28	20	46	92
32	18	-	40	12	36	25	M5	19	56	1/8	10	45	M8	42	20	8	32	20	48	102
40	22	-	45	12	42	32	M6	25	63	1/4	12	45	M10	45	25	12	40	32	55	115
50	28	-	56	12	42	32	M6	25	75	1/4	12	53	M10	56	28	12	40	32	57	125
63	36	15°	63	18	63	50	M6	28	85	3/8	12	56	M12	65	28	12	45	32	71	145
80	45	-	80	18	63	50	M6	28	106	3/8	12	63	M16	80	32	12	50	32	74	152
100	56	-	100	24	80	63	M8	34	125	1/2	16	70	M18	97,5	38	15	58	35	81	177
125	70	-	125	24	80	63	M8	34	160	1/2	16	80	M20	125	40	15	63	35	93	198

**Mounting styles 2 and 6: rectangular flange at head (in mm)**

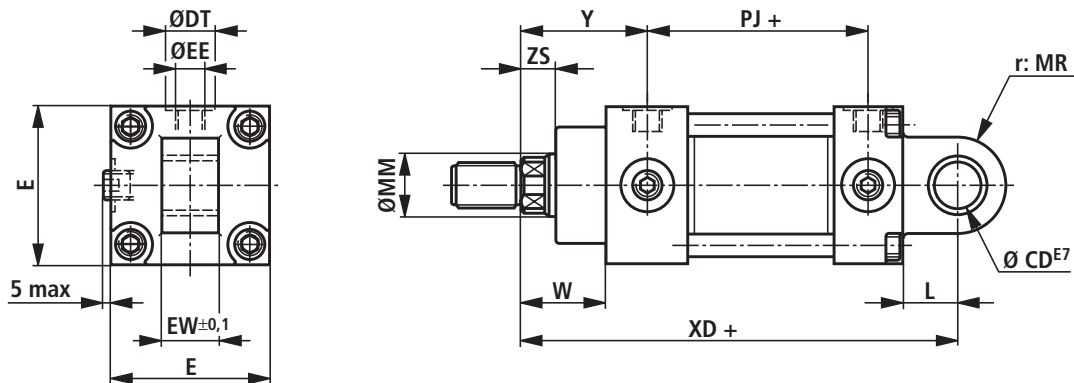
HVBS to CNOMO 05.07.67



HVBD sensor rod: see page 4

**Mounting styles 4 and 8: self-aligning clevis at base (in mm)**

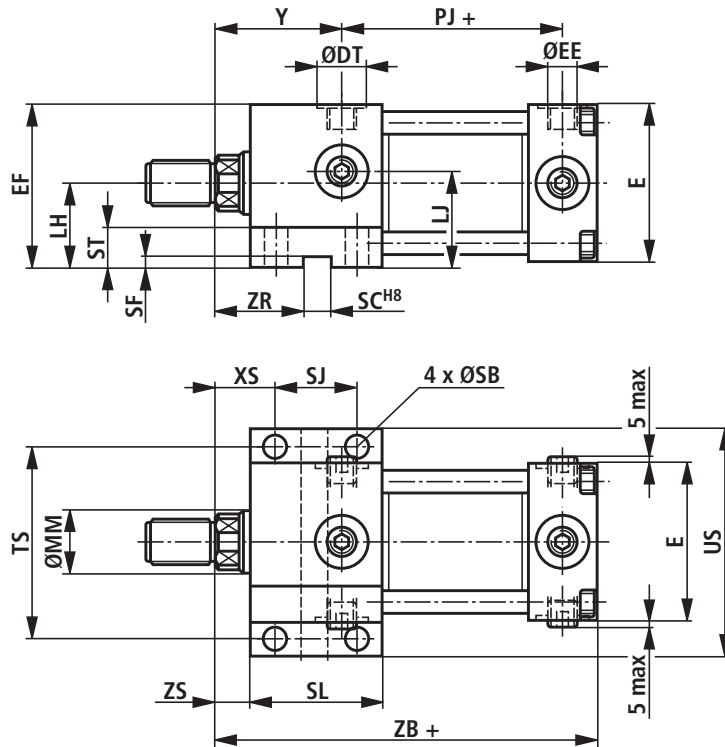
HVBS to CNOMO 05.07.69



AL	MM	B	CD	DT	E	EE	EW	L	MR	PJ	RB	TF	UF	W	WF	XD	Y	ZB	ZS
Ø	Ø	e9	E7				± 0,1												
25	16	36	12	19	45	1/8	16	20	14	34	34	56	70	28	16	112	46	92	12
32	18	40	12	19	56	1/8	16	20	14	45	36	71	86	32	16	122	48	102	12
40	22	45	16	25	63	1/4	20	25	16	45	45	80	100	40	20	140	55	115	15
50	28	56	20	25	75	1/4	25	25	20	53	50	95	115	40	16	150	57	125	12
63	36	63	25	28	85	3/8	32	32	25	56	65	104	124	45	21	177	71	145	17
80	45	80	32	28	106	3/8	40	40	32	63	80	132	160	50	22	192	74	152	18
100	56	100	40	34	125	1/2	50	56	40	70	98	155	185	58	24	233	81	177	20
125	70	125	50	34	160	1/2	63	63	50	80	125	195	230	63	27	261	93	198	23

## Mounting styles 3 and 7: foot mounting at head (in mm)

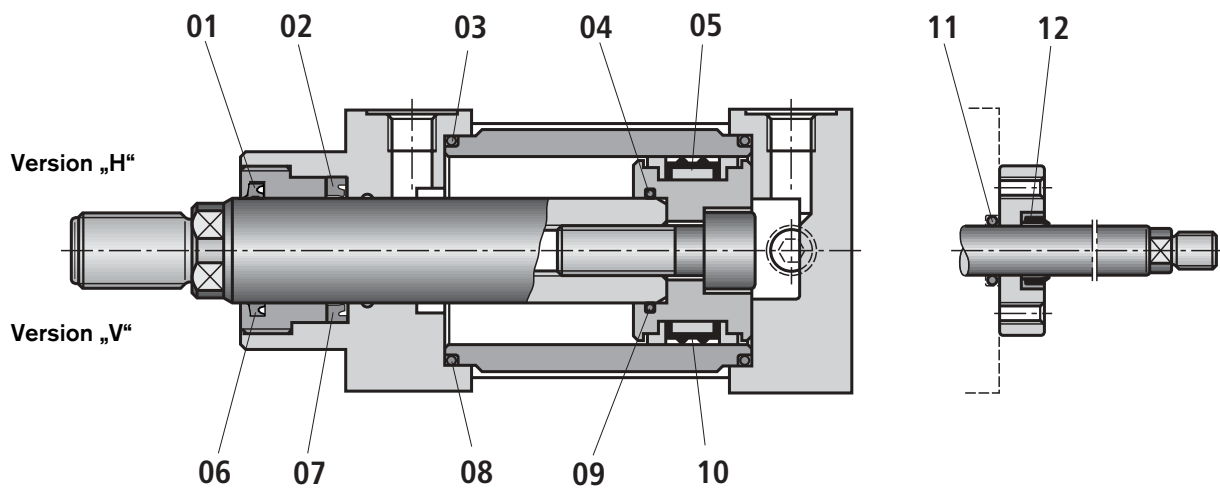
HVBS to CNOMO 05.07.68



HVBD sensor rod: see page 4

AL	MM	DT	E	EE	EF	LH	LJ	PJ	SB	SC	SF	SJ	SL	ST	TS	US	XS	Y	ZB	ZR	ZS
Ø	Ø									H8											
25	16	19	45	1/8	47.5	25	30	34	6.6	12	4	32	45	12	56	70	18.5	46	92	28.5	12
32	18	19	56	1/8	59	31	32	45	9	12	4	32	50	12	71	86	21	48	102	31	12
40	22	25	63	1/4	67.5	36	45	45	11	12	6	36	55	20	80	100	24.5	55	115	36.5	15
50	28	25	75	1/4	80	42.5	45	53	11	12	6	40	60	20	95	115	22	57	125	36	12
63	36	28	85	3/8	87.5	45	57	56	14	16	6	45	70	25	104	124	29.5	71	145	44	17
80	45	28	106	3/8	109	56	60	63	18	16	6	50	80	25	132	160	33	74	152	50	18
100	56	34	125	1/2	129.5	67	70	70	20	16	6	56	90	32	155	185	37	81	177	57	20
125	70	34	160	1/2	162	82	82	80	22	20	6	63	100	36	195	230	41.5	93	198	63	23

## Spare parts



AL Ø	Seal version			Tightening torque Nm
	H	V	H	
	Pos. 01 – 05	Pos. 06 – 10	Pos. 11 + 12	
25	1 817 010 900	1 817 010 908	7472 ZOZ 850	6,5
32	1 817 010 901	1 817 010 909	7472 ZOZ 850	16
40	1 817 010 902	1 817 010 910	7472 ZOZ 851	31
50	1 817 010 903	1 817 010 911	7472 ZOZ 851	35
63	1 817 010 904	1 817 010 912	7472 ZOZ 852	60
80	1 817 010 905	1 817 010 913	7472 ZOZ 852	90
100	1 817 010 906	1 817 010 914	7472 ZOZ 853	200
125	1 817 010 907	1 817 010 915	7472 ZOZ 853	320

## Weight (in kg)

AL Ø	Mounting style				Stroke 100 mm
	1 / 5	2 / 6	3 / 7	4 / 8	
25	1.0	1.2	1.1	1.1	0.55
32	1.7	2.2	1.8	1.8	0.70
40	2.5	3.3	2.7	2.7	0.90
50	3.5	4.7	3.8	3.8	1.50
63	5.3	6.7	5.8	5.8	2.30
80	8.6	10.8	9.4	9.6	3.80
100	14.0	18.0	15.3	16.2	5.60
125	26.0	33.0	27.8	30.6	8.90

## Notes

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