DESCRIPTION

Hydraulic regulators series “HS” assure a constant speed of pneumatic cylinders during their working cycle. In fact in the control of tools, that during their movements meet different resistances (i.e. violent impacts and vibrations) with the consequent variation of speed due to the use of only pneumatic control, you could obtain coarse finishes of the tooling till reach the breaking of the same tool. The hydraulic speed regulators exploit the oil incompressibility that, passing from a chamber to another one through an externally adjustable flow regulator, manages to uniform the speed and, with the use of control valves, avoids dead times warranting perfectly repeatable stops independently from the applied load. The adjustment can be made during the piston rod thrust phase, retract phase or both. The stop valve (STOP), mounted in-line on the circuit, and the acceleration valves (SKIP), mounted in-parallel, can be inserted in both the phases. These are poppet valves, two port, pneumatically actuated and therefore they have to be operated to make the STOP valve insert and to cut out the SKIP one.



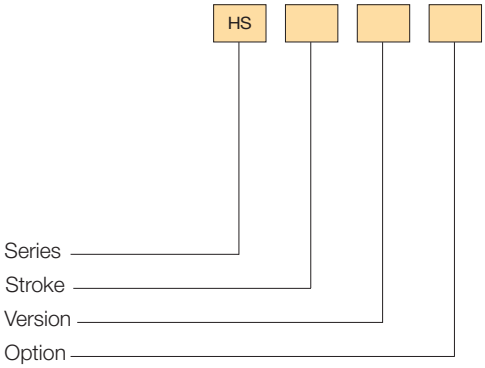
TECHNICAL DATA

Working temperature	0 ÷ +70 °C
Fluid	Hydraulic oil (WAIRSOL HS: contact our commercial office for details)
Versions	In-line tank, piston rod thrust adjustment; In-parallel tank, piston rod thrust adjustment; In-parallel tank, piston rod retract adjustment; In-parallel tank, double adjustment
Bore	Ø 40
Standard strokes (mm)	50, 100, 150, 200, 250, 300, 350, 400, 450, 500
Maximum stroke (mm)	1000
Maximum adjustable load	6000 N
Minimum/Maximum permissible speed (mm/min)	60 ÷ 10.000
Pressure of skip and stop valves	min 4 bar

MATERIALS

End caps	Anodized aluminium alloy
Cylinder barrel	Drawn steel
Piston rod	C45 chromium-plated steel
Piston	Anodized aluminium alloy
Piston seal	NBR rubber
Piston rod seal	Polyurethane
Tie rods	Steel
Adjusting groups	Nickel-plated brass
Oil lever stick	Anodized aluminium alloy

ORDER KEY



VERSION

LU	In-line tank, piston rod thrust adjustment
PU	In-parallel tank, piston rod thrust adjustment
PR	In-parallel tank, piston rod retract adjustment
PD	In-parallel tank, double adjustment

OPTION

1	Standard adjustment
2	STOP valve adjustment
3	SKIP valve adjustment
4	SKIP and STOP valves adjustment

ORDER EXAMPLES

Hydraulic regulator HS, 100 mm stroke, in-parallel tank, stop valve thrust adjustment: **HS100 PU2**

Hydraulic regulator HS, 150 mm stroke, in-parallel tank, skip valve double adjustment + cylinder series “XT” Ø63, 150 mm stroke, magnetic piston type + fixing plate + connection bridle + nipple + threaded bar, ASSEMBLED:
HS150PD3 + 63/150 XT/M + HS/PT63 + HS/BR50/63 + HS/NP 50/63 + HS/BF Ø + M/HS

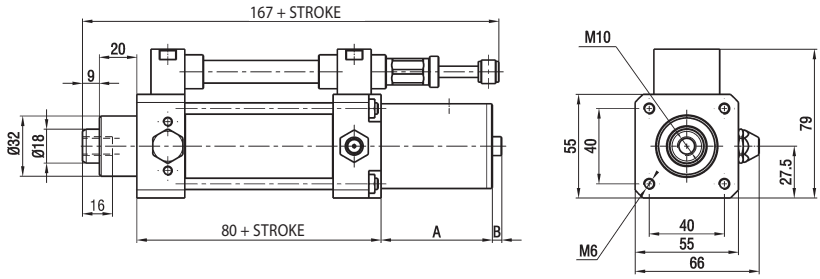
ASSEMBLY

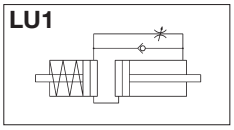
“HS”+ cylinders series “X” or “XT”	**M/HS**

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IN-LINE TANK-THRUST ADJUSTMENT - HS..LU1

WEIGHT: 2200 G (0 MM-STROKE) + 61 G EVERY 10 MM OF STROKE



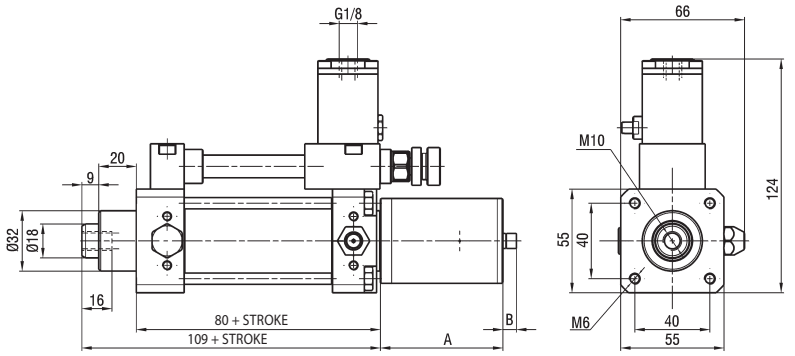


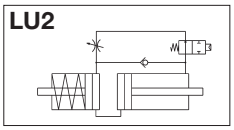
DIMENSIONS WITH IN-LINE TANK-THRUST ADJUSTMENT

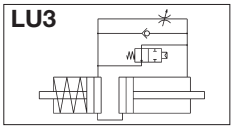
STROKES *(mm)*	A	B *(max)*
≤ 75	75	25
76 ÷ 150	90	39
151 ÷ 250	142	65
251 ÷ 350	171	87
351 ÷ 500	222	125

IN-LINE TANK-THRUST ADJUSTMENT - HS..LU2 - HS..LU3

WEIGHT LU2: 2700 g (50 mm-STROKE) + 61 g EVERY 10 mm OF STROKE (MIN. STROKE 50 mm)
WEIGHT LU3: 2300 G (0 MM-STROKE) + 61 G EVERY 10 MM OF STROKE (MIN. STROKE 50 MM)

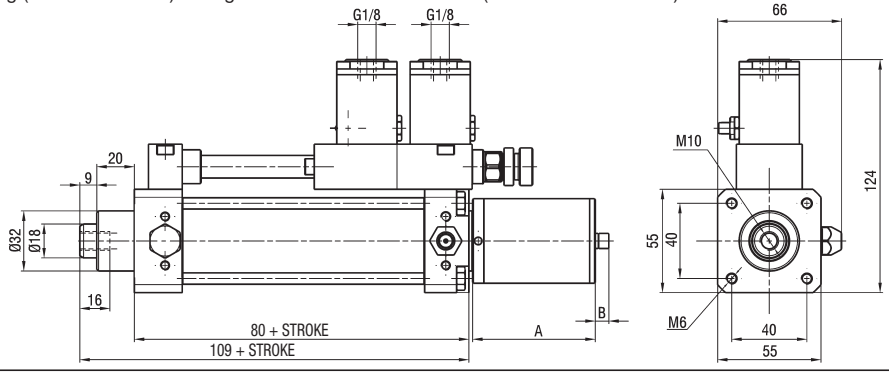


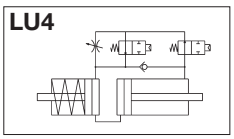




IN-LINE TANK-THRUST ADJUSTMENT - HS..LU4

WEIGHT: 2800 g (50 mm-STROKE) + 61 g EVERY 10 mm OF STROKE (MIN. STROKE 50 mm)



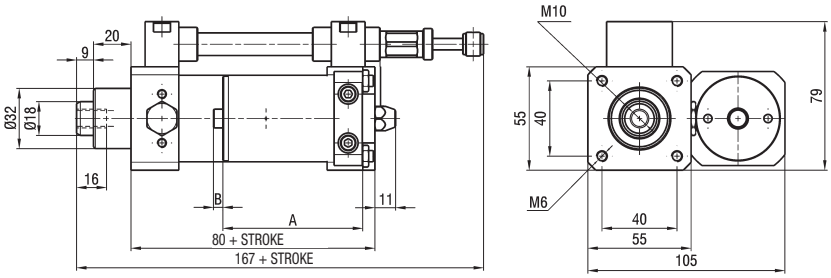


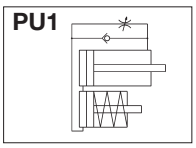
DIMENSIONS WITH IN-LINE TANK-THRUST ADJUSTMENT

STROKES *(mm)*	A	B *(max)*
≤ 75	60	25
76 ÷ 150	75	39
151 ÷ 250	127	65
251 ÷ 350	156	87
351 ÷ 500	205	125

IN-PARALLEL TANK-THRUST ADJUSTMENT - HS..PU1

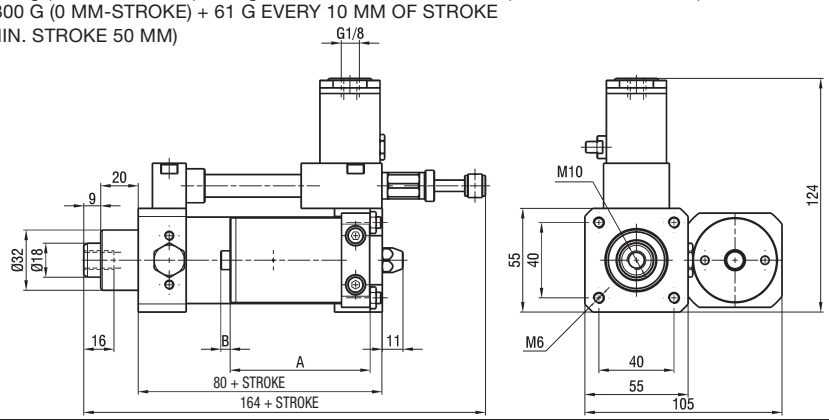
WEIGHT: 2200 G (0 MM-STROKE) + 61 G EVERY 10 MM OF STROKE

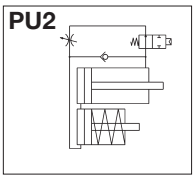


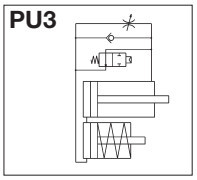


IN-PARALLEL TANK-THRUST ADJUSTMENT - HS..PU2 - HS..PU3

WEIGHT PU2: 2700 g (50 mm-STROKE) + 61 g EVERY 10 mm OF STROKE (MIN. STROKE 50 mm)
WEIGHT PU3: 2300 G (0 MM-STROKE) + 61 G EVERY 10 MM OF STROKE
(MIN. STROKE 50 MM)

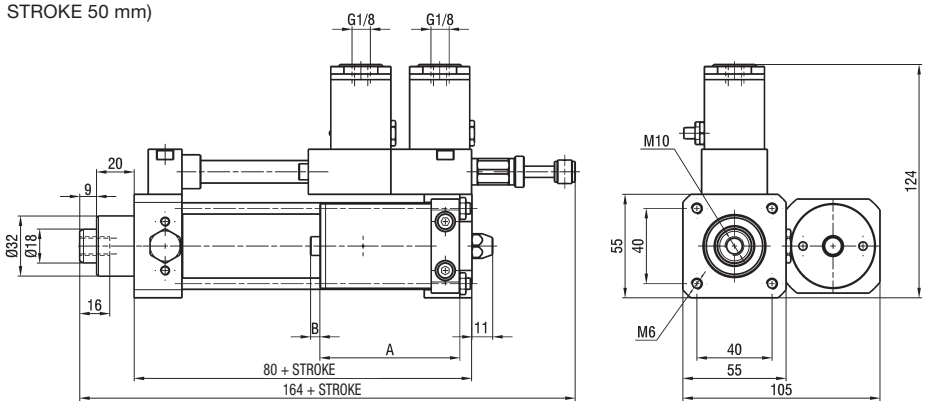


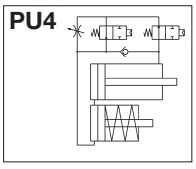




IN-PARALLEL TANK-THRUST ADJUSTMENT - HS..PU4

WEIGHT: 2800 g (50 mm-STROKE) + 61 g EVERY 10 mm OF STROKE
(MIN. STROKE 50 mm)





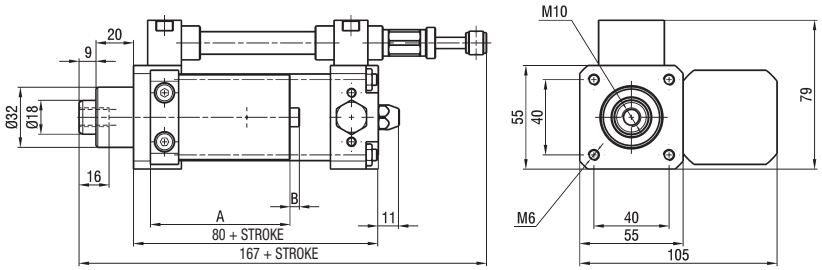
DIMENSIONS WITH IN-PARALLEL TANK-THRUST ADJUSTMENT

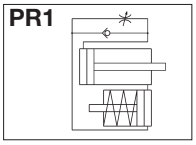
STROKES *(mm)*	**A**	**B** *(max)*
≤ 75	75	25
76 ÷ 150	90	39
151 ÷ 250	142	65
251 ÷ 350	171	87
351 ÷ 500	222	125

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IN-PARALLEL TANK-RETRACT ADJUSTMENT - HS..PR1

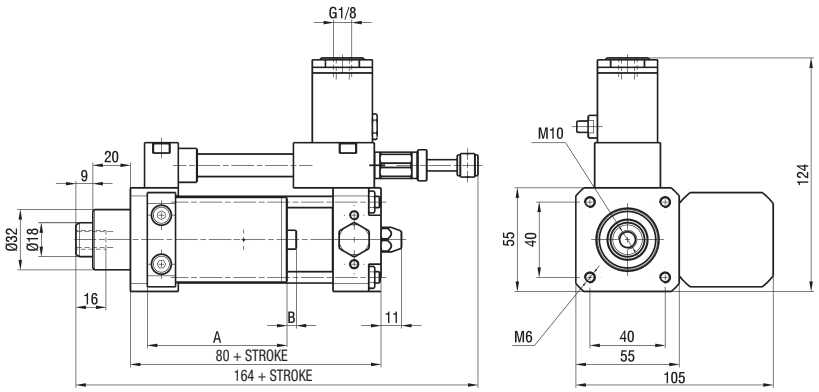
WEIGHT: 2200 G (0 MM-STROKE) + 61 G EVERY 10 MM OF STROKE

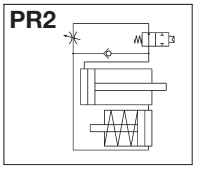


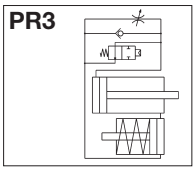


IN-PARALLEL TANK-RETRACT ADJUSTMENT - HS..PR2 - HS..PR3

WEIGHT PR2: 2700 g (50 mm-STROKE) + 61 g EVERY 10 mm OF STROKE (MIN. STROKE 50 mm)
WEIGHT PR3: 2300 g (0 mm-STROKE) + 61 g EVERY 10 mm OF STROKE (MIN. STROKE 50 mm)

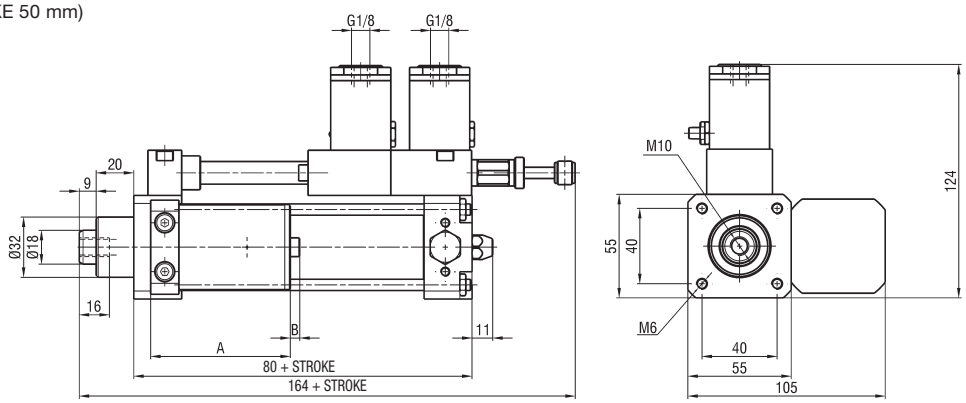


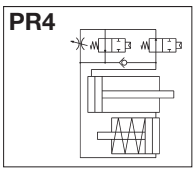




IN-PARALLEL TANK-RETRACT ADJUSTMENT - HS..PR4

WEIGHT: 2800 g (50 mm-STROKE) + 61 g EVERY 10 mm OF STROKE
(MIN. STROKE 50 mm)



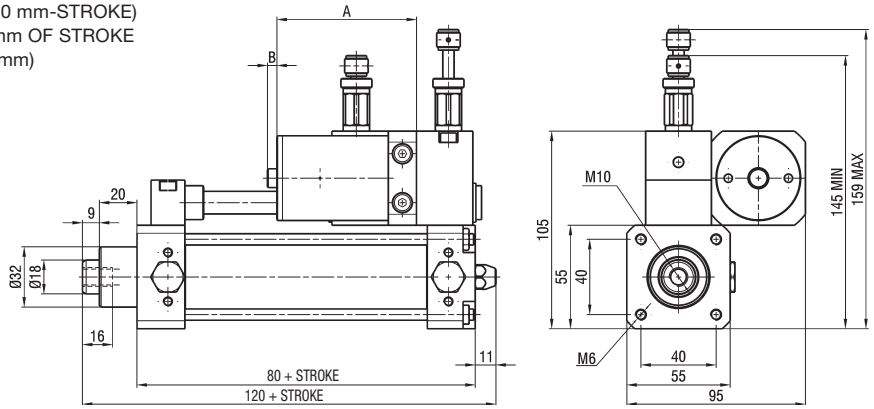


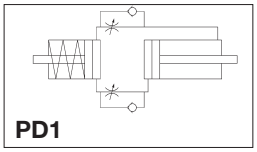
DIMENSIONS WITH IN-PARALLEL TANK-RETRACT ADJUSTMENT

STROKES *(mm)*	**A**	**B *(max)***
≤ 75	75	25
76 ÷ 150	90	39
151 ÷ 250	142	65
251 ÷ 350	171	87
351 ÷ 500	222	125

IN-PARALLEL TANK-DOUBLE ADJUSTMENT HS..PD1

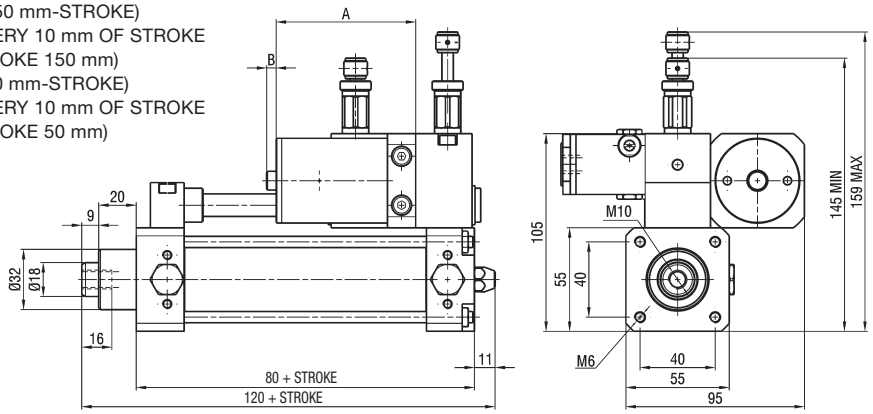
WEIGHT: 2900 g (50 mm-STROKE)
+ 61 g EVERY 10 mm OF STROKE
(MIN. STROKE 50 mm)

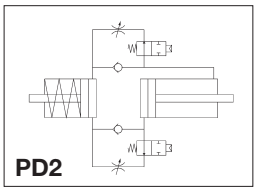


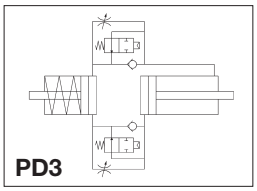


IN-PARALLEL TANK-DOUBLE ADJUSTMENT HS..PD2 - HS..PD3

WEIGHT PD2: 4100 g (150 mm-STROKE)
+ 61 g EVERY 10 mm OF STROKE
(MIN. STROKE 150 mm)
WEIGHT PD3: 3100 g (50 mm-STROKE)
+ 61 g EVERY 10 mm OF STROKE
(MIN. STROKE 50 mm)







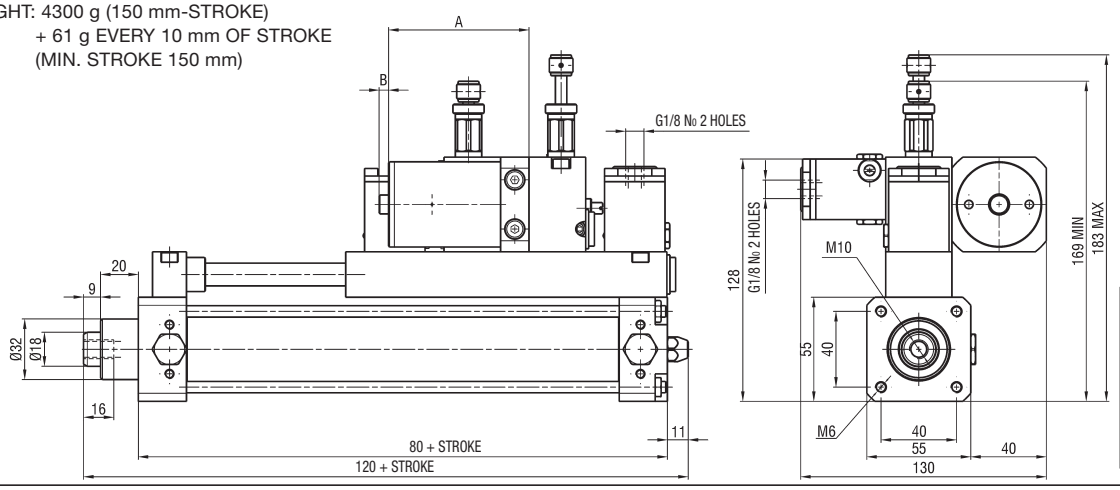
DIMENSIONS WITH IN-PARALLEL TANK-DOUBLE ADJUSTMENT

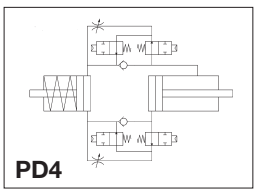
STROKES *(mm)*	A	B *(max)*
50 ÷ 75	75	25
76 ÷ 150	90	39
151 ÷ 250	142	65

STROKES *(mm)*	A	B *(max)*
251 ÷ 350	171	87
351 ÷ 500	222	125

IN-PARALLEL TANK-DOUBLE ADJUSTMENT HS..PD4

WEIGHT: 4300 g (150 mm-STROKE)
+ 61 g EVERY 10 mm OF STROKE
(MIN. STROKE 150 mm)





DIMENSIONS WITH IN-PARALLEL TANK-DOUBLE ADJUSTMENT

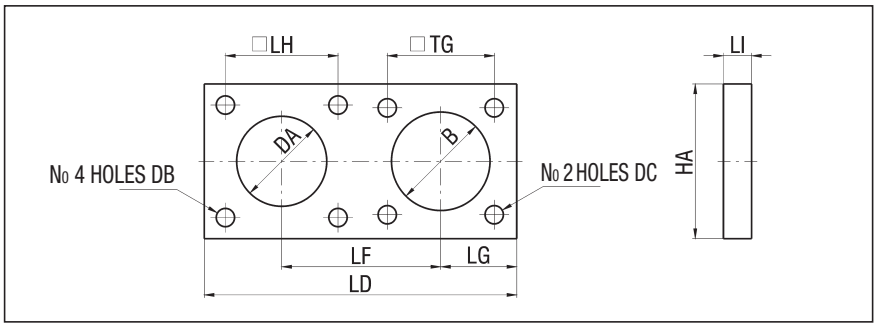
STROKES *(mm)*	A	B *(max)*
150 ÷ 250	142	65
251 ÷ 350	171	87
351 ÷ 500	222	125

1

FIXING PLATE HYDRAULIC REGULATOR/CYLINDERS SERIES “X” and “XT” - HS/PT Ø

Ø	B	DA	DB	DC	HA	LD	LF
40	35	32	6,5	6,5	55	111	56,5
50	40	32	6,5	8,5	65	122	62
63	45	32	6,5	8,5	75	132	67
80	45	32	6,5	10,5	95	152	77
100	55	32	6,5	10,5	115	171	86,5

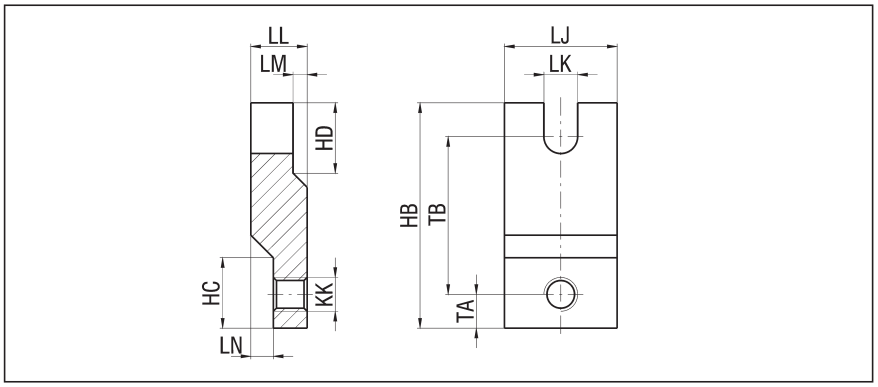
Ø	LG	LH	LI	TG	WEIGHT (g)
40	27	40	10	38	315
50	32,5	40	10	46,5	430
63	37,5	40	12	56,5	666
80	47,5	40	12	72	1080
100	57	40	15	89	1879



CONNECTION BRIDLE HYDRAULIC REGULATOR/CYLINDERS SERIES “X” and “XT” PISTON RODS - HS/BR Ø

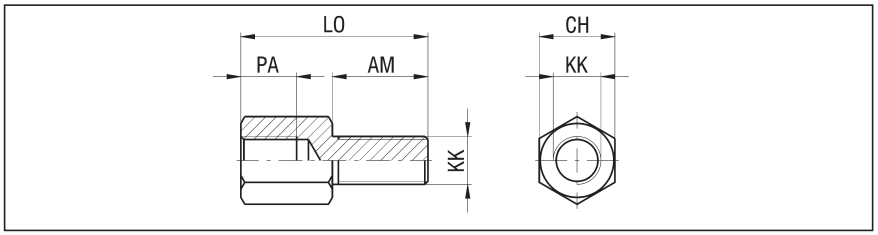
Ø	HB	HC	HD	KK	LJ	LK	LL
40	80	25	25	M12x1,25	40	12	20
50 - 63	90	-	-	M16x1,5	40	12	15
80 -100	117	-	-	M20x1,5	50	12	20

Ø	LN	LM	TA	TB	WEIGHT (g)
40	8	5	12	56	351
50 - 63	-	-	11,5	62	369
80 -100	-	-	18	77	818



CYLINDERS SERIES “X” and “XT” RESTORATION THREAD NIPPLE- HS/NP Ø

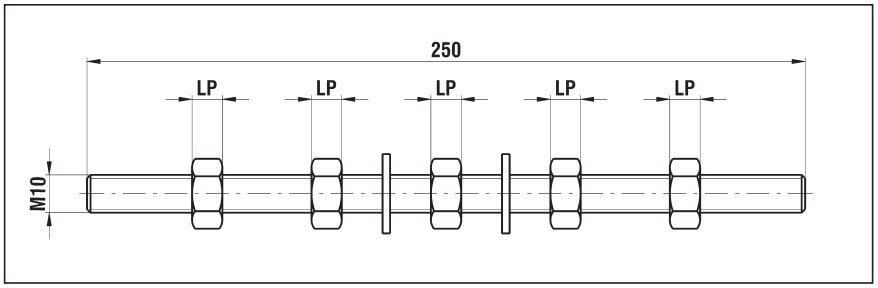
Ø	AM	CH	KK	LO	PA	WEIGHT (g)
40	24	19	M12x1,25	47	14	59
50 - 63	32	24	M16x1,5	65	19	131
80 -100	40	30	M20x1,5	78	24	245



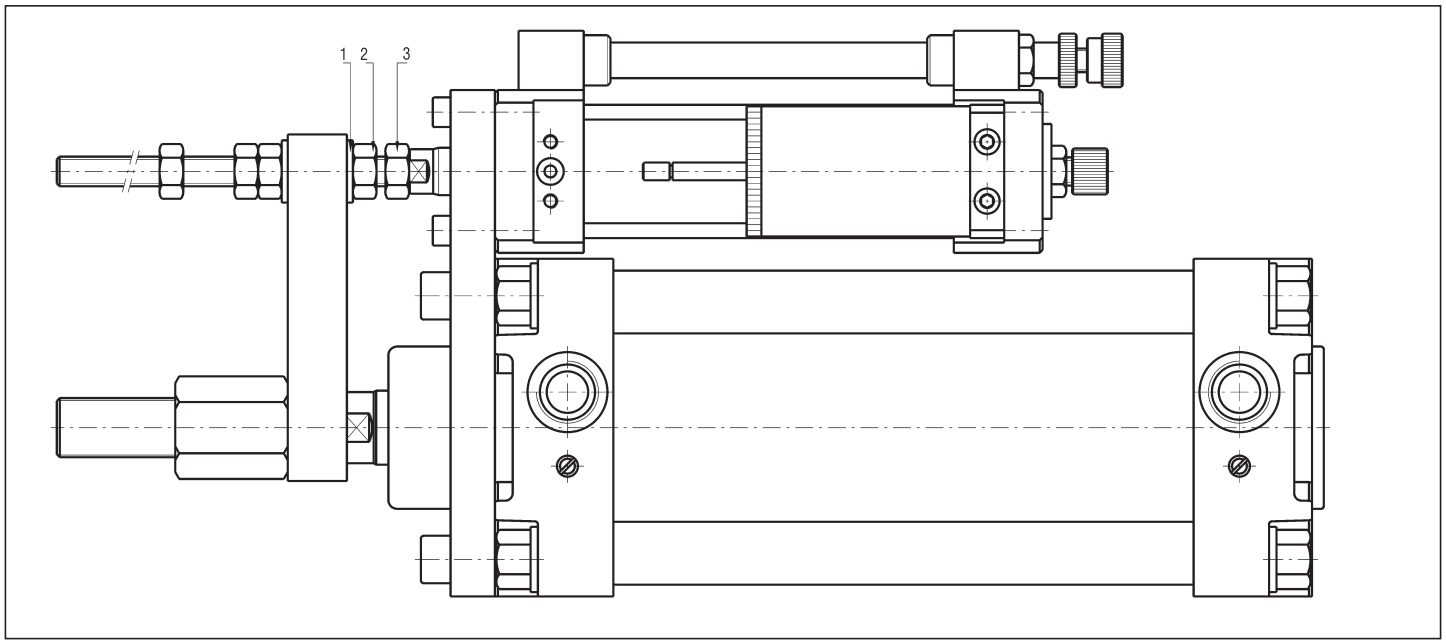
THREADED BAR - HS/BF Ø

Ø	LP	WEIGHT (g)
40	6	166
50 ÷ 100	8	178

P.S.: THREADED BAR IS SUPPLIED WITH 5 NUTS AND 2 WASHERS



FIXATION HYDRAULIC REGULATOR/CYLINDERS SERIES “X” and “XT”



Ø	1	2	3
40 ÷ 63	-	X	-
80	-	X	X
100	X	X	X

P.S.: DO NOT TIGHTEN THE BRIDLE - THREADED BAR COUPLING

REINSTATEMENT PROCEDURE OF THE OIL LEVEL

HYDRAULIC SPEED REGULATORS ARE CLOSED CIRCUIT SYSTEMS SUPPLIED WITH A TANK FOR THE COMPENSATION OF THE ROD VOLUME.
THIS TANK IS DESIGNED TO FACE LITTLE FLUID LOSSES DURING THE WORKING. IN THE EVENIENCE THAT DURING THE WORKING THE LEAKAGE OF OIL OVERCOME THE QUANTITY OF OIL IN EXCESS IN THE TANK, THE REGULATOR MUST BE REFILLED. THIS OPERATION MUST BE DONE WHEN THE INDICATOR NOTCH SITUATED ON THE DIP-STICK IN THE COMPENSATOR TANK IS NO MORE VISIBLE WHEN THE MAIN ROD IS COMPLETELY EXTENDED.
TO REFILL THE HYDRAULIC SPEED REGULATOR USE A STANDARD GREASING SYRINGE, THAT CAN BE EASILY FOUND IN THE MARKET.
THIS SYRINGE HAS TO BE CHARGED WITH “WAIRSOL HS” OIL.

REFILLING OPERATION:

1) PUT THE HYDRAULIC REGULATOR IN VERTICAL POSITION WITH THE FILLING VALVE, SITUATED ON THE REAR END CAP, THAT HAS TO BE HIGH-FACING.
2) EXTEND COMPLETELY THE HYDRAULIC REGULATOR PISTON ROD.
3) APPLY THE SYRINGE, FILLED WITH OIL, TO THE CONICAL SLOT OF THE FILLING VALVE ABOVE MENTIONED.
4) PUMP THE OIL IN THE REGULATOR WITH THE SYRINGE PAYING ATTENTION THAT THE SAME SHOULDN’T GO COMPLETELY EMPTY DURING THE RECHARGE (IF THIS OCCURS, STOP AND TOPPING UP THE SYRINGE).
5) CHARGE TILL THE MINIMUM NOTCH DOESN’T EXCEED THE LEVEL OF THE COMPENSATOR DIP-STICK PLUG OF 5 ÷ 8 mm.
6) OPERATE MORE TIMES THE REGULATOR MAIN PISTON ROD, TAKING CARE OF REGULATING THE CUSHIONINGS TO OBTAIN THE MAXIMUM SPEED.
7) WITH THE PISTON ROD COMPLETELY RETRACTED AND WITH THE CYLINDER ALWAYS IN VERTICAL POSITION, OPERATE THE CLOSING MUSHROOM OF THE FILLING VALVE WITH A SPIKY TOOL SO THAT POSSIBLE AIR BUBBLES CAN BLEED .
8) REPEAT THE OPERATIONS FROM POINT No. 2 TO POINT No. 7 TILL THE AIR IN THE CIRCUIT WILL BE COMPLETELY ELIMINATED.