KRATOSPACK

PNEUMO-HYDRAULIC POWER UNITS

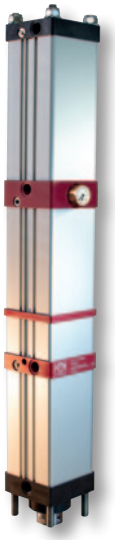
H SERIES

KRATOSPACK®

PNEUMO-HYDRAULIC POWER UNITS - SERIES H

Bores Ø : 50 - 63 - 80 - 100 - 125 mm.

SERIES H



- Mounting possible in any position and without expansion tank
- Approach stroke at high speed
- Working force standard or powered
- Oil tank without dedicated pneumatic port
- Internal hydraulic circuit
- Working strokes; 5÷25. Total strokes 30÷215 Standard for all the bores
- Return strokes pneumatically cushioned at the end of the stroke
- Port for oil monitoring level by manometer or pressure gauge
- Magnetic pistons for the separate control of the approach stroke and of the power stroke
- Control of process on high pressure chamber and monitoring of the oil level
- “T” groves for sensors and/or position transducers
- Facility on installation and limited weight

TECHNICAL FEATURES	
Construction	Caps fixed on profiled tube by tie-rods, pneumatic cushions on the return strokes.
Function	Stroke of approach / return: Double acting pneumatic Stroke of work: Single acting pushing
Standard materials	External caps in C45 phosphatized, intermediate cap in aluminium alloy red anodized, external piston rod in C45 grounded and hard chromium plated, internal piston rod at high resistance in 42CrMo4 grounded and hard chromium plated, profiled tube in aluminium EN AW-6060 T6 gauged and anodized, return piston rod in stainless steel, working piston rod in nitrille rubber and aluminium, seals NBR and PU.
Note regarding materials	According to REACH (1907/2006/EC and s.a.s.)
Bores	Ø 50, 63, 80, 100, 125 mm
Strokes total standard	30, 60, 115, 165, 215 mm (approach and work)
Strokes of work standard	5, 10, 15, 20, 25 mm
Strokes not standard	To be agreed with the Commercial Department
Working temperature	0°C ÷ +50°C
Working pressure	1 ÷ 10 bar (HLU, HPU, HRU) 1 ÷ 8 bar (HLX, HPX, HRX)
Fluid of the pneumatic circuit	Filtered air, without lubrication, according to ISO 8573-1:2010 [7:4:4]
Fluid of the hydraulic circuit	Hydraulic oil ISO 22

TECHNICAL DATA										
Bore Ø (mm)		**50**		**63**		**80**		**100**		**125**	
Version		HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX
Pneumatic ports		1/4”		3/8”		3/8”		1/2”		1/2”	
Piston rod Ø (mm)		22		30		40		60		60	
Piston rod thread (female)		M10 x 1,5		M12 x 1,5		M16 x 1,5		M20 x 1,5		M20 x 1,5	
Forces	**Work stroke at 6 bar** (daN)	821	1182	1496	2037	2886	3770	5131	6494	8018	11545
	Approach stroke at 6 bar (daN)	97	97	154	154	254	254	388	388	606	606
	Return stroke at 6 bar (daN)	87	87	142	142	222	222	296	296	426	426
Consumption	**Work stroke at 6 bar** (nl/ 1mm)	0,190	0,273	0,347	0,473	0,673	0,880	1,202	1,521	1,874	2,698
	Approach stroke at 6 bar (nl/10mm)	0,219	0,219	0,353	0,353	0,566	0,566	0,814	0,814	1,229	1,229
Speed	**Work stroke at 6 bar** (mm/sec)	153	153	110	110	74	74	51	51	42	42
	Approach stroke at 6 bar (mm/sec)	990	990	920	920	780	780	630	630	520	520
	Return stroke at 6 bar (mm/sec)	810	810	720	720	610	610	490	490	410	410

PNEUMO-HYDRAULIC POWER UNITS SERIES H

High force with accurate control of process

BONESI PNEUMATIK proposes a new range of pneumo-hydraulic power units, **series H - KRATOSPACK**, developed and produced totally at its italian headquarter, for the applications in which a high pushing force and a fast speed of positioning are required.

The project characteristics, acquired during over thirty years experience, are the synthesis of two applied technologies:

- The pneumatic motion during the approach to the piece and during the return to the rest position;
- The hydraulic power increase during the work phase.

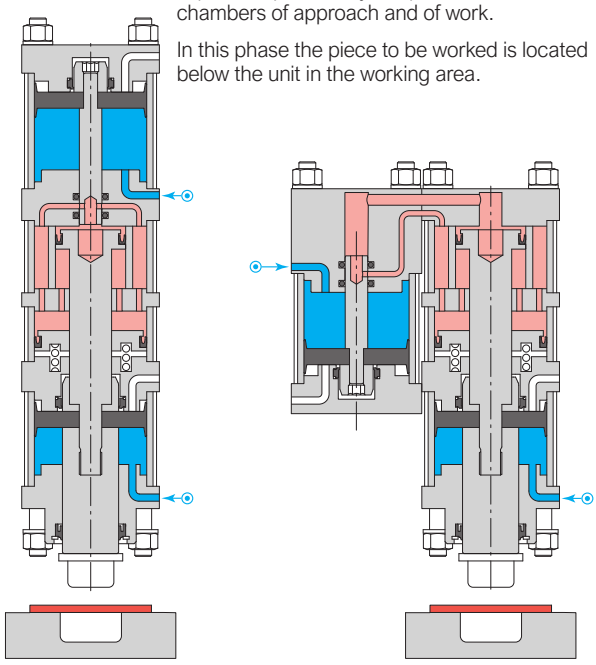
The system have the strict separation of the pneumatic circuit from the hydraulic one, and, being possible to regulate both systems, to act with high precision whether on the forces or on the strokes of approach and of work.

MAIN PHASES OF FUNCTIONING

PHASE OF REST (1)

During the **rest phase** the piston rod of the unit is kept in his position by the pneumatic action in the chambers of approach and of work.

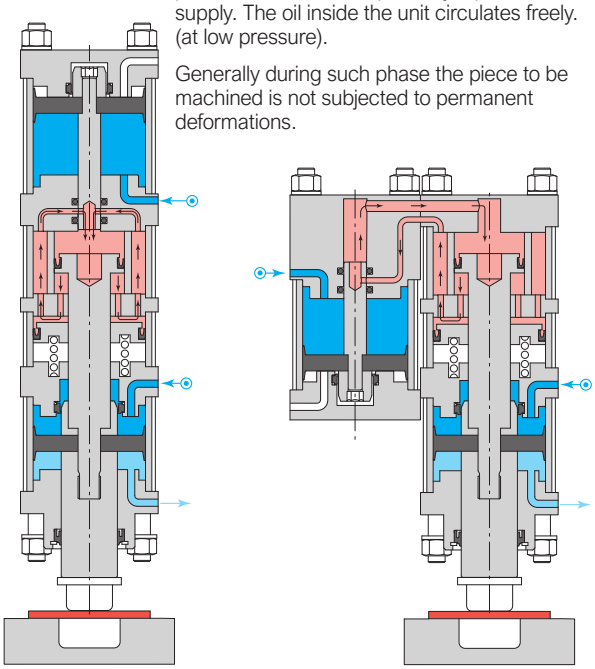
In this phase the piece to be worked is located below the unit in the working area.



PHASE OF FAST APPROACH (2)

During the **fast approach phase** the piston rod is put in contact with the piece by a pneumatic supply. The oil inside the unit circulates freely. (at low pressure).

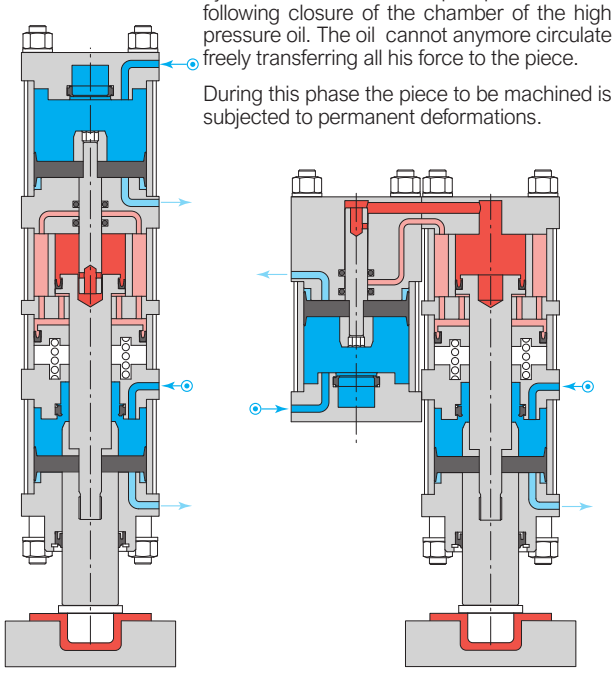
Generally during such phase the piece to be machined is not subjected to permanent deformations.



PHASE OF WORK (3)

During the **work phase** the force is increased by the insertion of the multiplier piston rod and following closure of the chamber of the high pressure oil. The oil cannot anymore circulate freely transferring all his force to the piece.

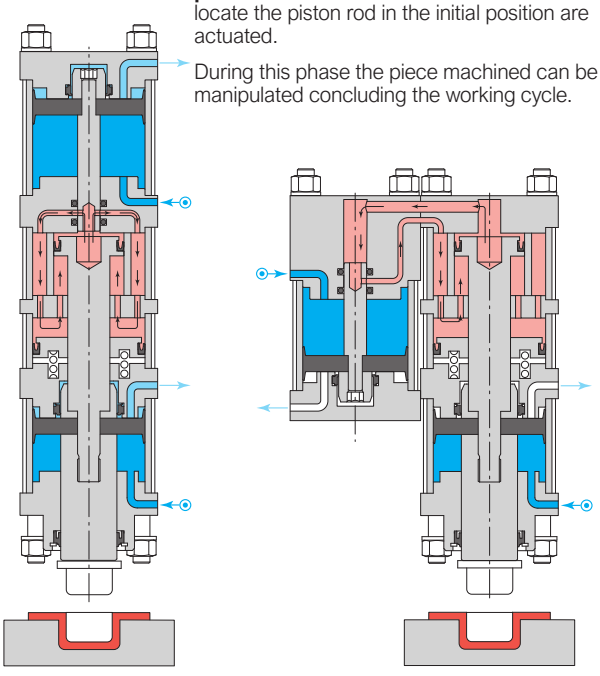
During this phase the piece to be machined is subjected to permanent deformations.



PHASE OF FAST RETURN (4)

At the end of the machining during the **fast return phase** the force is exhausted and the valves that locate the piston rod in the initial position are actuated.

During this phase the piece machined can be manipulated concluding the working cycle.



TECHNICAL FEATURES

Several possibilities of choice among the standard versions

The new range of pneumo-hydraulic power units, **series H - KRATOSPACK**, includes the bores **Ø50, Ø63, Ø80, Ø100, Ø125** mm with total strokes of **30, 60,115,165, 215** mm and **work strokes** of **5, 10, 15, 20, 25** mm, as standard and independently combinable between them.
All the bores and the above mentioned strokes are available in the versions with:

- Standard work force: **HLU, HPU, HRU**
- Increased work force: **HLX, HPX, HRX**

The versions with higher force have an increased pushing force keeping the same bore and the same side dimension, but having an higher length. It is possible to use the increased work force versions in case reduced lengths in comparison to the higher bore size could be necessary and/or reducing the consumption of air without compromising the work force.

THE FORCES

Bore Ø (mm)		**50**		**63**		**80**		**100**		**125**	
Version		HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX
Force* on work stroke [1] (daN)	2 bar	274	394	499	679	962	1257	1710	2165	2673	3848
	4 bar	547	788	998	1358	1924	2513	3421	4330	5345	7697
	6 bar	821	1182	1496	2037	2886	3770	5131	6494	8018	11545
	8 bar	1095	1576	1995	2715	3848	5027	6842	8659	10690	15394
	10 bar	1368	-	2494	-	4811	-	8552	-	13363	-
Force* on approach stroke (daN)	2 bar	32	32	51	51	85	85	129	129	202	202
	4 bar	65	65	103	103	169	169	259	259	404	404
	6 bar	97	97	154	154	254	254	388	388	606	606
	8 bar	129	129	206	206	339	339	517	517	808	808
	10 bar	162	-	257	-	423	-	647	-	1010	-
Force* on return stroke (daN)	2 bar	29	29	47	47	74	74	99	99	142	142
	4 bar	58	58	94	94	148	148	197	197	284	284
	6 bar	87	87	142	142	222	222	296	296	426	426
	8 bar	115	115	189	189	296	296	394	394	568	568
	10 bar	144	-	236	-	369	-	493	-	710	-

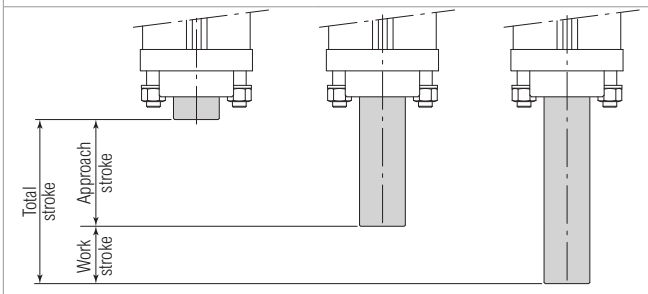
* The force is directly proportional to the pressure involved

THE CONSUMPTIONS

Bore Ø (mm)		**50**		**63**		**80**		**100**		**125**	
Version		HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX
Consumption* of air on work stroke (nl/ 1mm)	2 bar	0,081	0,117	0,149	0,203	0,289	0,377	0,515	0,652	0,803	1,156
	4 bar	0,136	0,195	0,248	0,338	0,481	0,628	0,859	1,087	1,338	1,927
	6 bar	0,190	0,273	0,347	0,473	0,673	0,880	1,202	1,521	1,874	2,698
	8 bar	0,244	0,351	0,447	0,608	0,866	1,131	1,545	1,956	2,409	3,469
	10 bar	0,298	-	0,546	-	1,058	-	1,889	-	2,944	-
Consumption* of air on approach stroke (nl/ 10mm)	2 bar	0,094	0,094	0,151	0,151	0,243	0,243	0,349	0,349	0,527	0,527
	4 bar	0,156	0,156	0,252	0,252	0,404	0,404	0,581	0,581	0,878	0,878
	6 bar	0,219	0,219	0,353	0,353	0,566	0,566	0,814	0,814	1,229	1,229
	8 bar	0,281	0,281	0,453	0,453	0,728	0,728	1,046	1,046	1,580	1,580
	10 bar	0,343	-	0,554	-	0,890	-	1,279	-	1,931	-

* The consumption is directly proportional to the pressure involved

THE STROKES



Independently from the bore and from the version the power units of **series H - KRATOSPACK** have, as standard, total strokes and work strokes that can be combined each other without limitations.

The **total strokes**, including the approach stroke and the work stroke are:

- **30, 60, 115, 165, 215** mm.

Independently, the **work stroke** can be chosen among:

- **5, 10, 15, 20, 25** mm.

The technical-commercial staff of **BONESI PNEUMATIK** is available to evaluate the various needs of the customer.

Bore Ø (mm)	**50**		**63**		**80**		**100**		**125**	
Version	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX	HLU-HPU-HRU	HLX-HPX-HRX
Total strokes	30 - 60 - 115 - 165 - 215									
Work strokes [2]	5 - 10 - 15 - 20 - 25									

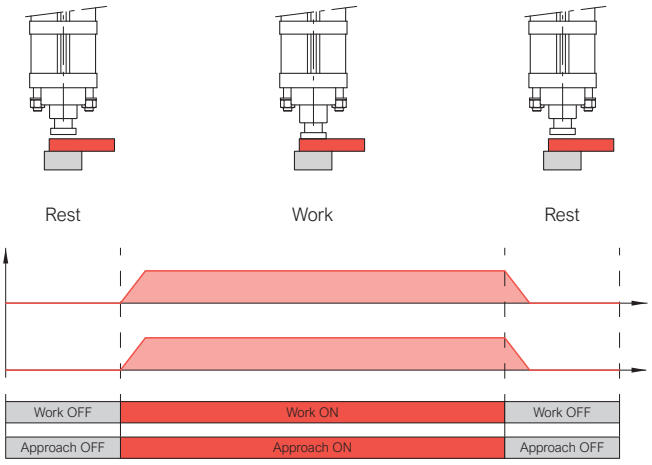
[1] The force on the work stroke, in the version HRX and HRU, is reduced of 25% in comparison to the value showen on the table.
[2] The work stroke, in the versione HRX and HRU, is increased of 33% in comparison to the value showen on the table.

TYPICAL APPLICATIONS

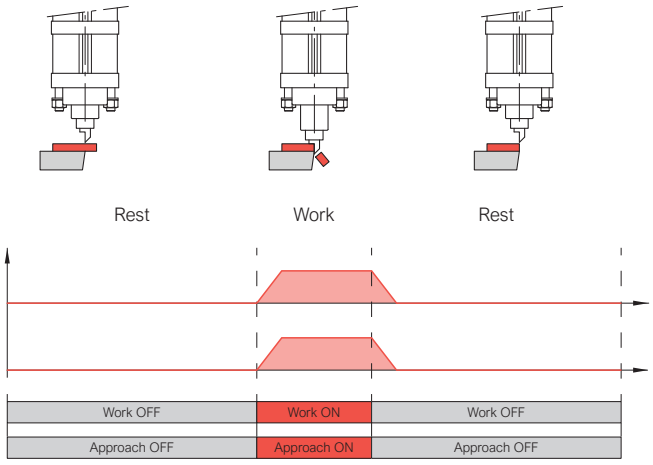
Wide versatility in the industrial automation field

The production features before described, make the power units proposed by **BONESI PNEUMATIK** particularly usefull in the industrial automation field to develop several works, like:
blocking, rivetting, banding, marking, pressing, cutting, stamping, drawing, tracing, assembling, caulking, flanging, clinching, punching..

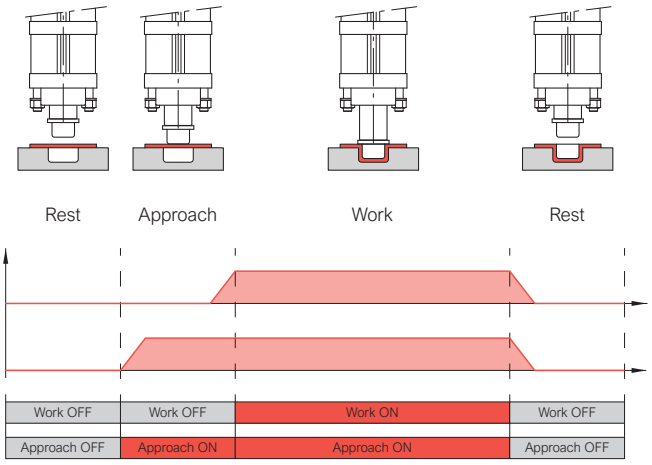
BLOCKING, ASSEMBLING



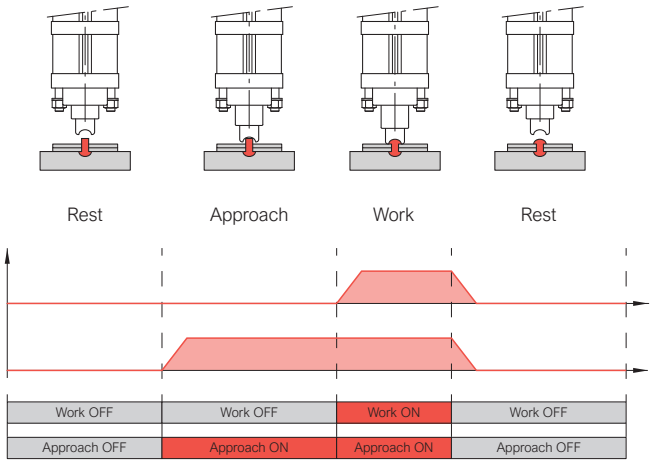
CUTTING, FLANGING



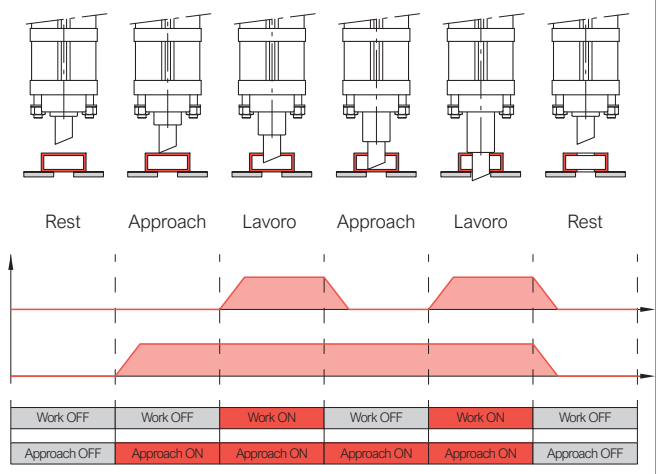
DRAWING, BANDING, PRESSING



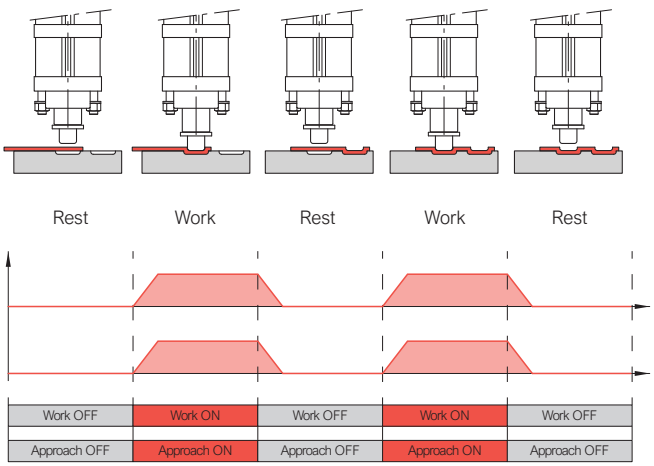
RIVETTING, CLINCHING



STAMPING, MARKING

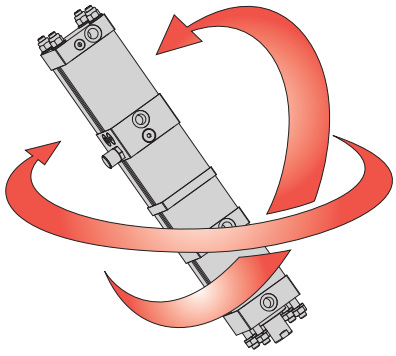


CUTTING, PUNCHING



MAIN FEATURES OF THE POWER UNITS

No restrictions regarding the mounting position



One of the main advantages that qualifies the **BONESI PNEUMATIK** power units is the absence of any restriction regarding the mounting position.
Thanks to an accurate technical study, all the units of the **series H - KRATOSPACK** are supplied ready for their use without the necessity to agree with the commercial department the relevant positioning.

Further points that qualify the power units **series H - KRATOSPACK** are:

- Oil tank integrated in the central body and without a dedicated pneumatic supply;
- Internal hydraulic circuiting;
- Weight and measurements reduced.

These expedients, acquired during over thirty years experience in the engineering and production of components for pneumatic and pneumo-hydraulic automation, mean **facility on mounting** for the end user.

The power units of the **series H - KRATOSPACK** can be used according a pneumatic circuit developed by the customer, like the shown example:

The start of the cycle is actuating the **valve start cycle** decided by the customer according the characteristics of the machine that switches the **start of the approach valve** causing the motion of the piston rod for all the approach stroke.

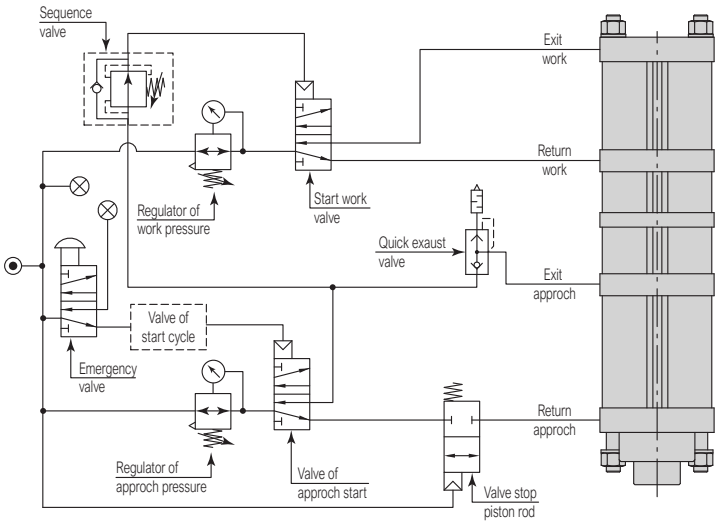
At the contact with the piece to be machined and reached the value of pressure set up on the **sequence valve** the piston rod of the **start work valve** is switched generating the **push force** on the piece for all the work stroke.

The work cycle will finish deactivating the valve start cycle and the return of the piston rod

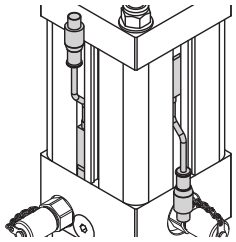
The **regulator of approach pressure** and the **regulator of work pressure** allow an accurate control of the forces during both phases.

The system is safeguarded by an **emergency valve** that stops the work cycle and re-locates the piston rod in the security position.

The **valve stop piston rod** prevents the motion of the piston rod in case of absence of air.



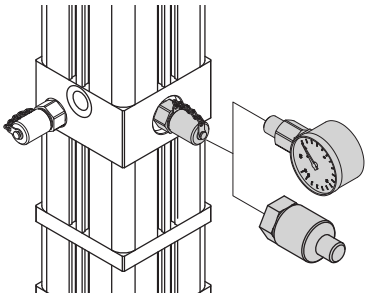
Magnetic piston rods and “T” groves for sensors and position transducers



All the power pneumo-hydraulic units of **series H - KRATOSPACK** are equipped, as standard, with magnetic rings on the pneumatic piston rods that allow the control of their position during the phases of the approach and of the work.

By the placement of a sensor it is possible to send an electrical impulse to a controller that monitors the position of the piston rod during the various phases.

(See pages 2.4.05.28, 2.4.05.30, 2.4.05.31)



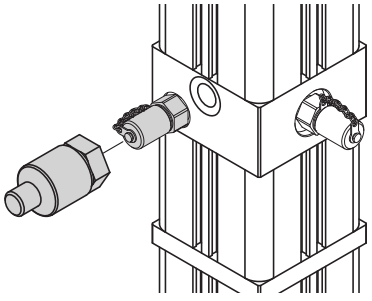
Monitoring of the oil level

BONESI PNEUMATIK supplies the power pneumo-hydraulic units with an hydraulic test coupling connected to the oil tank inside the units.
As standard the power pneumo-hydraulic units are equipped with analogical manometer that, showing the pressure in the low pressure chamber, indicates the remaining oil level in the tank.

Through the hydraulic test coupling, the analogical manometer can be replaced with a pressure transducer that sends an electrical impulse to a controller, monitoring the oil level in the unit.

(See page 2.4.05.22, 2.4.05.23, 2.4.05.29).

Control of process on high pressure chamber



The units of **series H - KRATOSPACK** are supplied with a hydraulic test coupling on the high pressure chamber.

Through the hydraulic test coupling, it is possible to assemble on the unit a pressure transducer to control the process

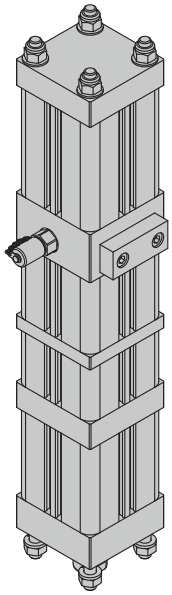
The advantage of this shape is the elimination of the dimension of a possible load cell, but considering that the pressure transducer reads exclusivity the work force at net of the force given by the unit during the approach phase.

(See **HU PT 05 - HU PT 06** page 2.4.05.29).

THE VERSIONS

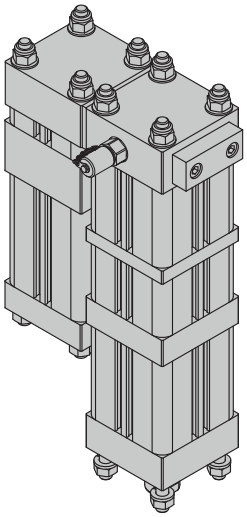
HLU - HLX

Pneumatic cylinder and hydraulic multiplier coaxially assembled.
Standard: magnetic pistons for the separate control of the approach stroke and of the work one, pneumatic cushions on both the return strokes.



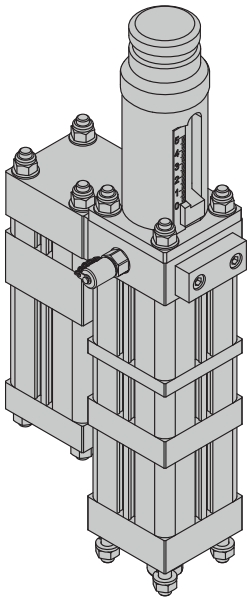
HPU - HPX

Pneumatic cylinder and hydraulic multiplier in parallel assembled.
Standard: magnetic pistons for the separate control of the approach stroke and of the work one, pneumatic cushions on both the return strokes.



HRU - HRX

Pneumatic cylinder and hydraulic multiplier in parallel assembled.
Mechanical end of stroke regulator.
Standard: magnetic pistons for the separate control of the approach stroke and of the work one, pneumatic cushions on both the return strokes.



STROKE REGULATORS

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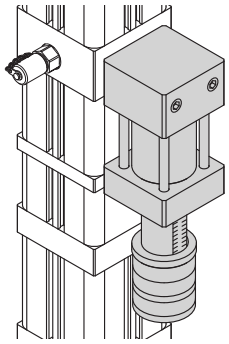

Valve to limit the work stroke

On the power pneumo-hydraulic unit **series H - KRATOSPACK**, except those of the series HRU-HRX, it is possible to assemble the valve to limit the stroke.
Acting on a nonius situated externally of the unit, the user can limit the work stroke of the piston rod during its exit.

The valve commensurates the quantity of the oil inside the tank adjusting the stroke of the piston rod with high precision. The customer therefore can adjust the work stroke according the characteristics of the piece that must be machined.

The standard regulation of the limit valve is 0÷15 mm.

The technical-commercial staff of **BONESI PNEUMATIK** is available to evaluate different needs of the customer.

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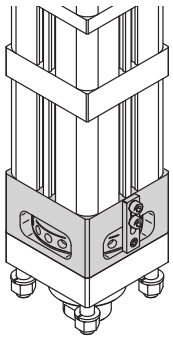


Total stroke mechanical regulator

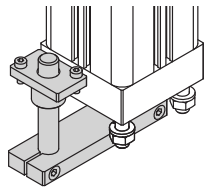
The total stroke mechanical regulator group allow to reduce the exit stroke of the main rod by a fine adjustement on the regulation screw.

The meccanical regulator is available on all the series of power pneumo-hydraulic unit **series H - KRATOSPACK**, except those of the series HRU-HRX,

The use of such mechanical regulator group is useful when it is necessary to adjust the total stroke of the rod only in exit phase and keep the return stroke of the rod unchanged.

THE OPTIONS

... A

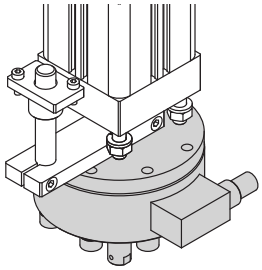


Antirotation group

The antirotation group availble for the power pneumo-hydraulic units **series H - KRATOSPACK** eliminates the rotation of the piston rod during the stroke of approach and of work.

The use of such mechanical device is useful when the accessory assembled on the piston rod needs to keep the same direction during the work cycles.

... E ... L ... C ... F



Load cell group

The load cell is necessary in case of need of a feedback of the work cycle set on the power unit.

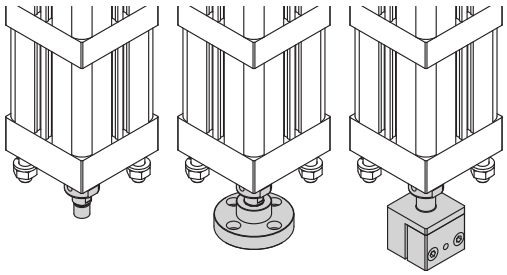
Connecting the load cell to a process controller the user can set on the device of control the curve of work according the specifications of the piece.

At the end of the cycle, the device will indicates if the parameters set have been respected (approved piece) or which parameters have excided the limit of tolerance (not conforming piece). Different load cells and control devices are available to satisfy the needs of the customer.

As standard, connected to the load cell, the unit is supplied with antirotation device.

The technical-commercial staff of **BONESI PNEUMATIK** is available to evaluate different needs of the customer.

... C ... M ... R



Shank and mould holder hub

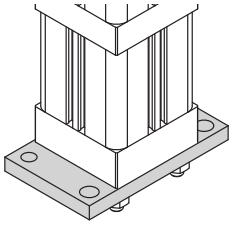
The assembling of the accessories of the pneumo-hydraulic power units **series H - KRATOSPACK** can be using the threaded hole present on the piston rod or using accessories appropriately proportionated for the unit.

The standard accessories available proposed by **BONESI PNEUMATIK** are:

- Male shank;
- Shank and mould holder hub;
- Radial mould holder.

The technical-commercial staff of **BONESI PNEUMATIK** is available to evaluate different needs of the customer.

... F



Front fixing flange

As standard, the pneuno-hydraulic power units **series H - KRATOSPACK** are supplied with front tie-rods that allow to fix the unit directly on the structure built by the customer.

Otherwise, it is possible to equip the unit with a front interface flange.

The technical-commercial staff of **BONESI PNEUMATIK** is available to evaluate different needs of the customer.

ORDERING CODE

Series	Bore	Total stroke	Work stroke	Stroke regulators	Antirotation group	Load cell group	Shank and mouldholder group	Front fixing flange
HLU	21	115	20					

Bore
- **19** = Ø 50 mm
- **20** = Ø 63 mm
- **21** = Ø 80 mm
- **22** = Ø 100 mm
- **23** = Ø 125 mm

Total stroke
- **030** = 30 mm
- **060** = 60 mm
- **115** = 115 mm
- **165** = 165 mm
- **215** = 215 mm

Work stroke
- **05** = 5 mm
- **10** = 10 mm
- **15** = 15 mm
- **20** = 20 mm
- **25** = 25 mm

Series
- **HLU** = Pneumatic cylinder and hydraulic multiplier assembled coaxially Standard force
- **HLX** = Pneumatic cylinder and hydraulic multiplier assembled coaxially Increased force
- **HPU** = Pneumatic cylinder and hydraulic multiplier assembled in parallel Standard force
- **HPX** = Pneumatic cylinder and hydraulic multiplier assembled in parallel Increased force
- **HRU** = Pneumatic cylinder and hydraulic multiplier assembled in parallel with end of stroke mechanical regulator Standard force
- **HRX** = Pneumatic cylinder and hydraulic multiplier assembled in parallel with end of stroke mechanical regulator Increased force

Stroke regulators
- **0** = Without stroke regulators
- **V** = With work stroke regulating valve 0 ÷ 15 mm
- **M** = With total stroke meccanical regulator

Antirotation group
- **0** = Without antirotation group
- **A** = With antirotation group

Load cell group
- **0** = Without load cell group
- **E** = With load cell of 25 kN
- **L** = With load cell of 50 kN
- **C** = With load cell of 100 kN
- **F** = With load cell of 200 kN

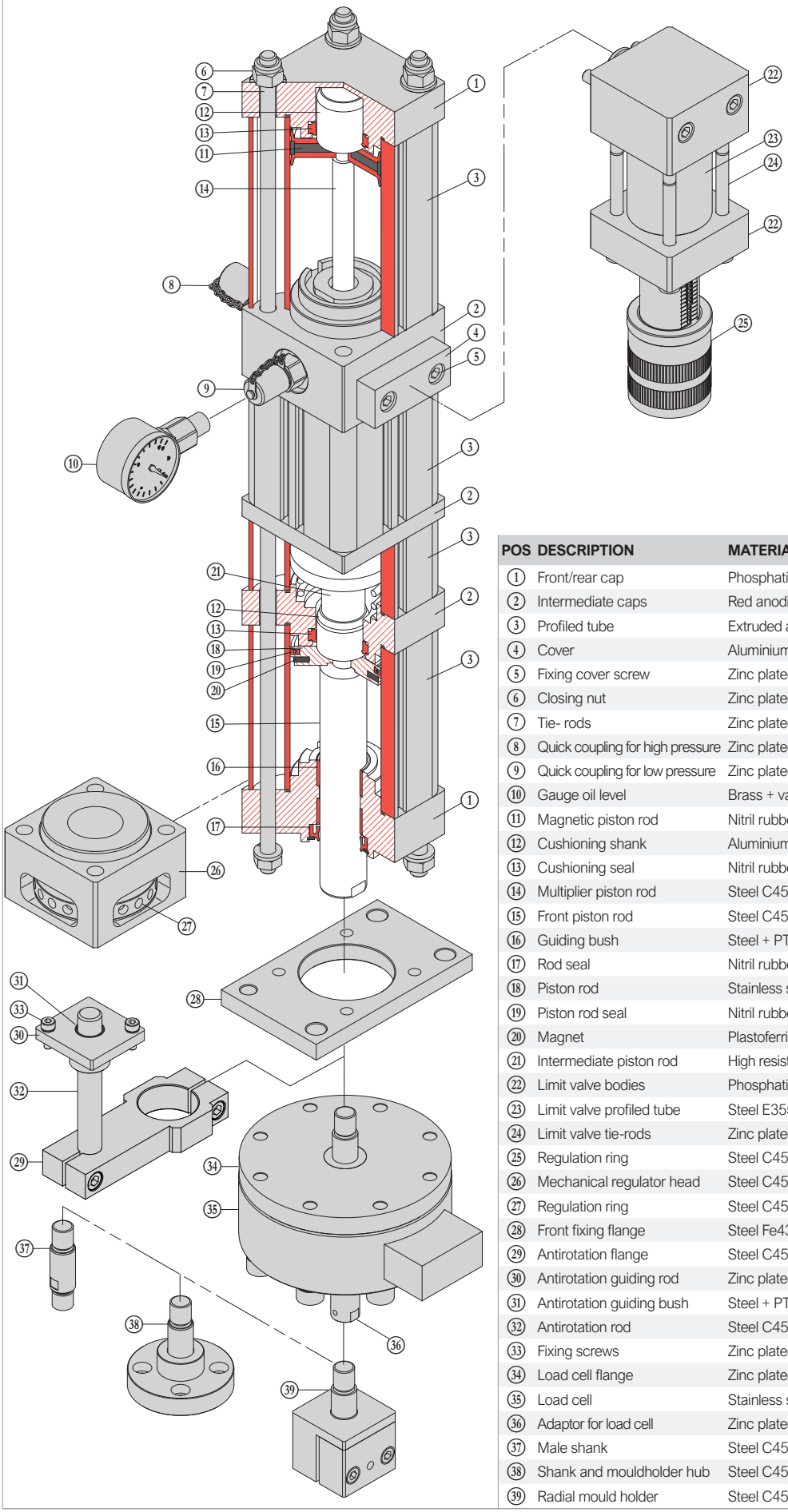
Shank and mouldholder group
- **0** = Without accessory
- **C** = Male shank
- **M** = Shank and mould holder hub
- **R** = Radial mould holder

Front fixing flange
- **0** = Without fixing flange
- **F** = With fixing flange

AVAILABLE CONFIGURATION

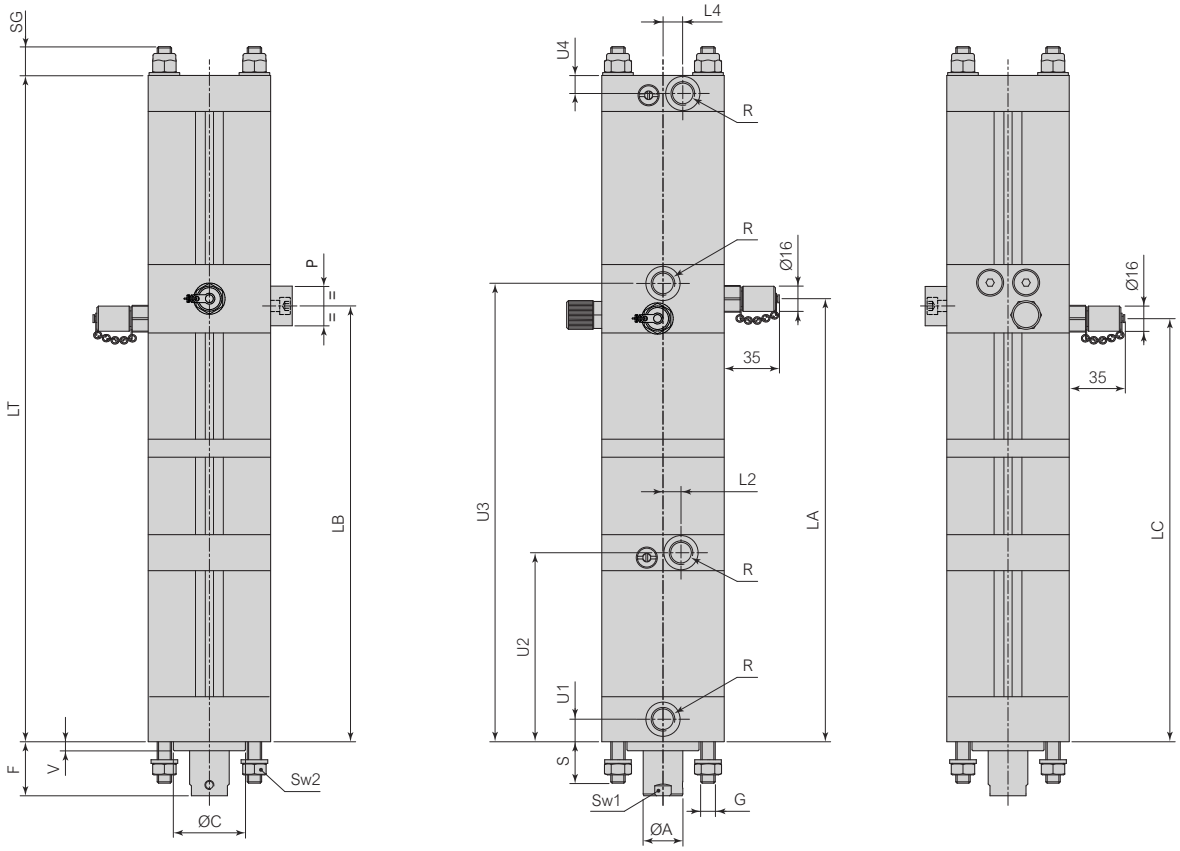
Series	Bore	Total stroke	Work stroke	Stroke regulators	Antirotation group	Load cell group	Shank and mouldholder group	Front fixing flange
HLU Assembled coaxially Standard force	19 Ø 50 mm	030 30 mm	05 5 mm	0 None	0 None	0 None	0 None	0 None
	20 Ø 63 mm	060 60 mm	10 10 mm	V Regulating valve	A Antirotation group	E 25 kN	C Male shank	F Fixing flange
	21 Ø 80 mm	115 115 mm	15 15 mm	M Meccanical regulator		L 50 kN	M Shank and mould holder	
HLX Assembled coaxially Increased force	22 Ø 100 mm	165 165 mm	20 20 mm			C 100 kN	R Radial mould holder	
	23 Ø 125 mm	215 215 mm	25 25 mm			F 200 kN		
HPU Assembled in parallel Standard force	19 Ø 50 mm	030 30 mm	05 5 mm	0 None	0 None	0 None	0 None	0 None
	20 Ø 63 mm	060 60 mm	10 10 mm	V Regulating valve	A Antirotation group	E 25 kN	C Male shank	F Fixing flange
	21 Ø 80 mm	115 115 mm	15 15 mm	M Meccanical regulator		L 50 kN	M Shank and mould holder	
HPX Assembled in parallel Increased force	22 Ø 100 mm	165 165 mm	20 20 mm			C 100 kN	R Radial mould holder	
	23 Ø 125 mm	215 215 mm	25 25 mm			F 200 kN		
HRU Assembled in parallel Stroke regulators Standard force	19 Ø 50 mm	030 30 mm	05 5 mm	0 None	0 None	0 None	0 None	0 None
	20 Ø 63 mm	060 60 mm	10 10 mm		A Antirotation group	E 25 kN	C Male shank	F Fixing flange
	21 Ø 80 mm	115 115 mm	15 15 mm			L 50 kN	M Shank and mould holder	
HRX Assembled in parallel Stroke regulators Increased force	22 Ø 100 mm	165 165 mm	20 20 mm			C 100 kN	R Radial mould holder	
	23 Ø 125 mm	215 215 mm	25 25 mm			F 200 kN		

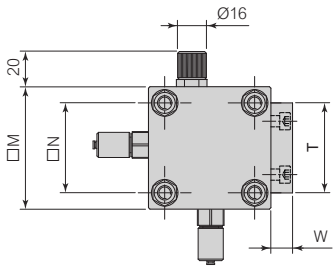
STANDARD MATERIALS

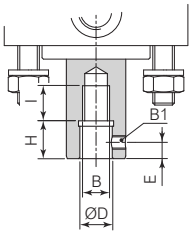


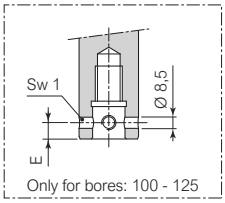
POS	DESCRIPTION	MATERIAL
1	Front/rear cap	Phosphatized steel C45
2	Intermediate caps	Red anodized aluminium alloy
3	Profiled tube	Extruded aluminium EN AW-6060 T6 gauged/anodized
4	Cover	Aluminium alloy neuter anodized
5	Fixing cover screw	Zinc plated steel
6	Closing nut	Zinc plated steel
7	Tie- rods	Zinc plated steel
8	Quick coupling for high pressure	Zinc plated steel + various materials
9	Quick coupling for low pressure	Zinc plated steel + various materials
10	Gauge oil level	Brass + various materials
11	Magnetic piston rod	Nitril rubber (NBR) / Aluminium
12	Cushioning shank	Aluminium alloy / Steel
13	Cushioning seal	Nitril rubber (NBR)
14	Multiplier piston rod	Steel C45 chromium plated 20 µm
15	Front piston rod	Steel C45 chromium plated 20 µm
16	Guiding bush	Steel + PTFE
17	Rod seal	Nitril rubber (NBR)
18	Piston rod	Stainless steel
19	Piston rod seal	Nitril rubber (NBR)
20	Magnet	Plastoferrite
21	Intermediate piston rod	High resistance steel 42CrMo4 chromium plated 20 µm
22	Limit valve bodies	Phosphatized steel C45
23	Limit valve profiled tube	Steel E355 painted
24	Limit valve tie-rods	Zinc plated steel 12.9
25	Regulation ring	Steel C45 phosphatized
26	Mechanical regulator head	Steel C45 phosphatized
27	Regulation ring	Steel C45 phosphatized
28	Front fixing flange	Steel Fe430 zinc plated
29	Antirotation flange	Steel C45 zinc plated
30	Antirotation guiding rod	Zinc plated steel
31	Antirotation guiding bush	Steel + PTFE
32	Antirotation rod	Steel C45 chromium plated 20 µm
33	Fixing screws	Zinc plated steel
34	Load cell flange	Zinc plated steel
35	Load cell	Stainless steel
36	Adaptor for load cell	Zinc plated steel
37	Male shank	Steel C45
38	Shank and mouldholder hub	Steel C45 zinc plated
39	Radial mould holder	Steel C45 zinc plated

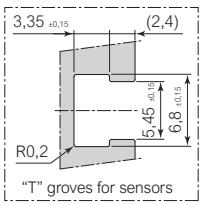
HLU - HLX











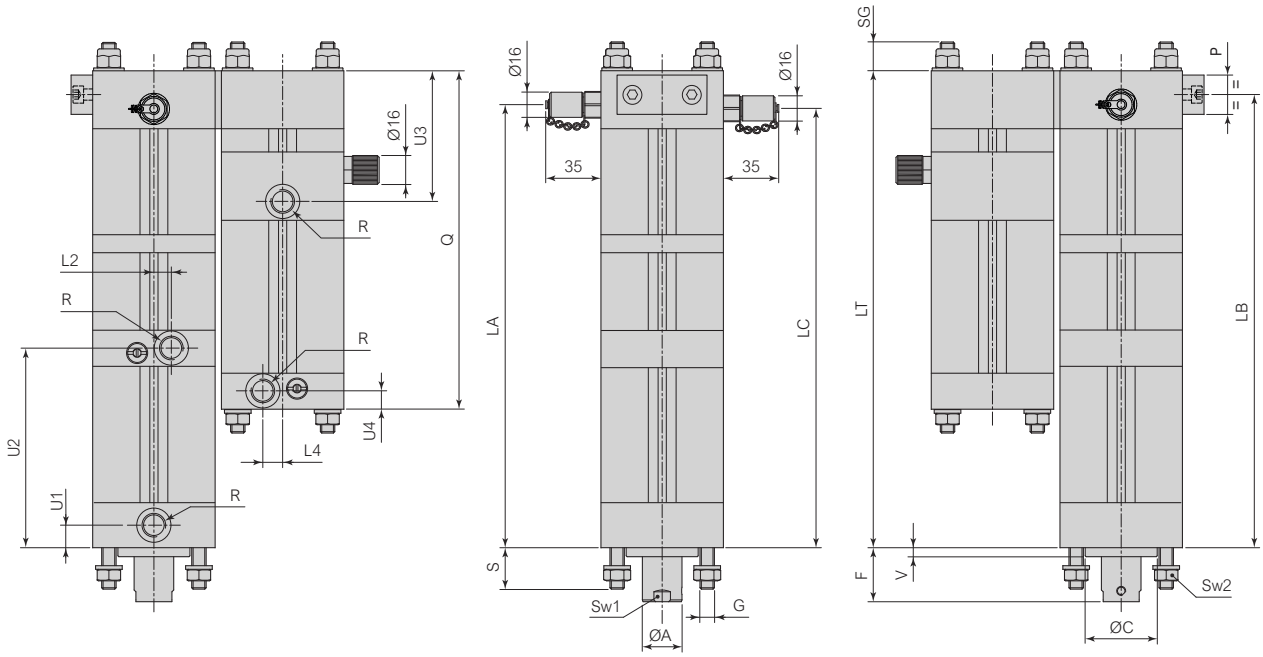
VARIABLE "K" TO CALCULATE: "LA", "LB", "LT", "U3"
K= (total stroke x 2) + (total stroke / 4)

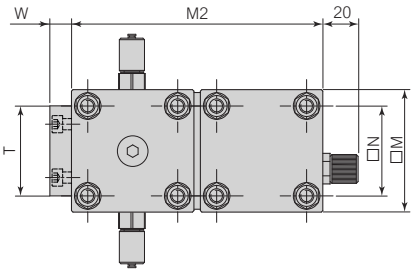
VARIABLE "Y" TO CALCULATE: "LT"					
	Bore	Y		Bore	Y
HLU - HPU - HRU	50	7,1	HLX - HPX - HRX	50	10,3
	63	8,2		63	11,1
	80	9,8		80	12,8
	100	11,1		100	14,1
	125	11,1		125	16

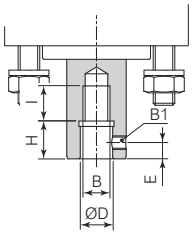
Bore	Ø A	B	B1	Ø C	Ø D	E	F	G	H	I	LA	LB	LC	LT	L2	L4
mm	f7			d11	H8											
50	22	M10 x 1,5	M5	40	12	6	30	M8	14	13	178,5 + K	174,5 + K	170,5 + K	267 + K + (Y x Work stroke)	10	11
63	30	M12 x 1,5	M6	50	16	8	40	M10	18	20	196,5 + K	192,5 + K	188,5 + K	292 + K + (Y x Work stroke)	15	14
80	40	M16 x 1,5	M8	65	20	10	50	M12	22	20	198,5 + K	194,5 + K	190,5 + K	309 + K + (Y x Work stroke)	16,5	16
100	60	M20 x 1,5	M8	90	25	12	60	M16	28	22	220 + K	217,5 + K	212 + K	326,5 + K + (Y x Work stroke)	14	14
125	60	M20 x 1,5	M8	110	25	12	60	M20	28	22	236 + K	234 + K	228 + K	360,5 + K + (Y x Work stroke)	20	20

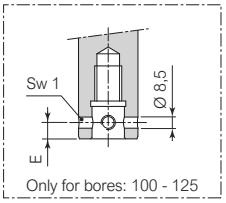
Bore	□ M	□ N	P	R	S	SG	Sw1	Sw2	T	U1	U2	U3	U4	V	W
mm															
50	68	50	25	Gas 1/4"	23	16	Ch 20	Ch 13	50	12,5	85 + Total stroke	187 + K	10	5	12
63	78	61	30	Gas 3/8"	29	16,5	Ch 27	Ch 16	60	15	87 + Total stroke	202,5 + K	12	15	13
80	98	75	30	Gas 3/8"	34	21,5	Ch 36	Ch 18	60	18	87 + Total stroke	205,5 + K	12	25	13
100	128	91	30	Gas 1/2"	51	27,5	Ø8,5 (x2)	Ch 24	70	17,5	96,5 + Total stroke	224 + K	14	26	18
125	149	110	30	Gas 1/2"	55	31,5	Ø8,5 (x2)	Ch 30	70	20	111,5 + Total stroke	240 + K	14	26	18

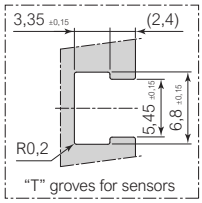
HPU - HPX











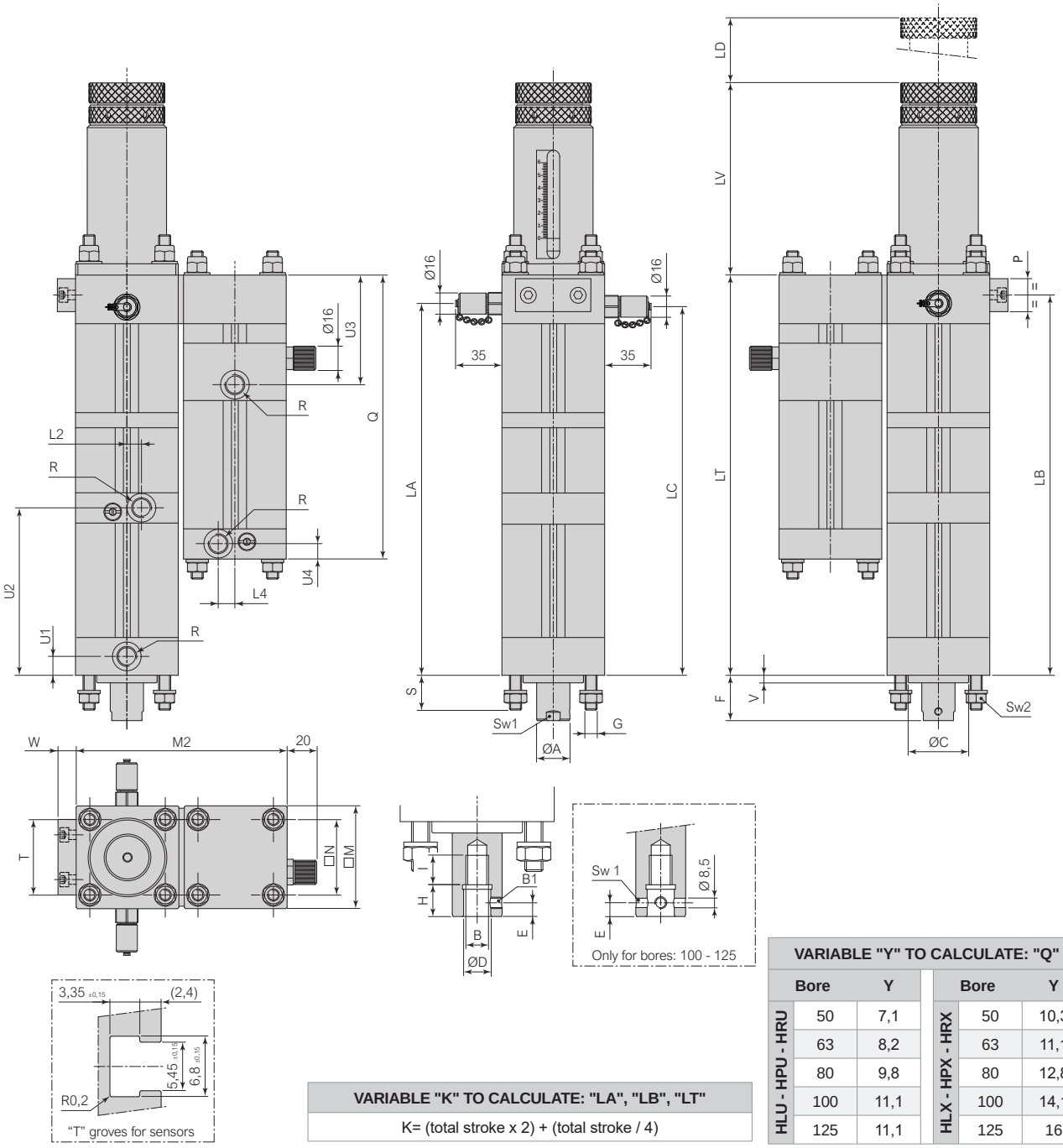
VARIABLE "K" TO CALCULATE: "LA", "LB", "LT"
K= (total stroke x 2) + (total stroke / 4)

VARIABLE "Y" TO CALCULATE: "Q"					
	Bore	Y		Bore	Y
HLU - HPU - HRU	50	7,1	HLX - HPX - HRX	50	10,3
	63	8,2		63	11,1
	80	9,8		80	12,8
	100	11,1		100	14,1
	125	11,1		125	16

Alesaggio	Ø A	B	B1	Ø C	Ø D	E	F	G	H	I	LA	LB	LC	LT	L2	L4	□M	M2	□N	P
mm	f7			d11	H8															
50	22	M10 x 1,5	M5	40	12	6	30	M8	14	13	175,5 + K	178,5 + K	178,5 + K	191,5 + K	10	11	68	139,5	50	25
63	30	M12 x 1,5	M6	50	16	8	40	M10	18	20	196,5 + K	196,5 + K	196,5 + K	215,5 + K	15	14	78	159,5	61	30
80	40	M16 x 1,5	M8	65	20	10	50	M12	22	20	198,5 + K	198,5 + K	198,5 + K	217,5 + K	16,5	16	98	199,5	75	30
100	60	M20 x 1,5	M8	90	25	12	60	M16	28	22	220 + K	220 + K	220 + K	239 + K	14	14	128	259,5	91	30
125	60	M20 x 1,5	M8	110	25	12	60	M20	28	22	236 + K	236 + K	236 + K	255 + K	20	20	149	299,5	110	30

Alesaggio	Q	R	S	SG	Sw1	Sw2	T	U1	U2	U3		U4	V	W
mm										HLU-HPU-HRU	HLX-HPX-HRX			
50	117 + (2 x Y x Work stroke)	Gas 1/4"	23	16	Ch 20	Ch 13	50	12,5	85 + Total stroke	37 + Work stroke	40 + Work stroke	10	5	12
63	126 + (2 x Y x Work stroke)	Gas 3/8"	29	16,5	Ch 27	Ch 16	60	15	87 + Total stroke	36,5 + Work stroke	27 + Work stroke	12	15	13
80	137,5 + (2 x Y x Work stroke)	Gas 3/8"	34	21,5	Ch 36	Ch 18	60	18	87 + Total stroke	34 + Work stroke	33 + Work stroke	12	25	13
100	140 + (2 x Y x Work stroke)	Gas 1/2"	51	27,5	Ø8,5 (x2)	Ch 24	70	17,5	96,5 + Total stroke	37,5 +Work stroke	37,5 + Work stroke	14	26	18
125	158 + (2 x Y x Work stroke)	Gas 1/2"	55	31,5	Ø8,5 (x2)	Ch 30	70	20	111,5 + Total stroke	37,5 + Work stroke	37,5 + Work stroke	14	26	18

HRU - HRX



VARIABLE "Y" TO CALCULATE: "Q"					
	Bore	Y		Bore	Y
HLU - HPU - HRU	50	7,1	HLX - HPX - HRX	50	10,3
	63	8,2		63	11,1
	80	9,8		80	12,8
	100	11,1		100	14,1
	125	11,1		125	16

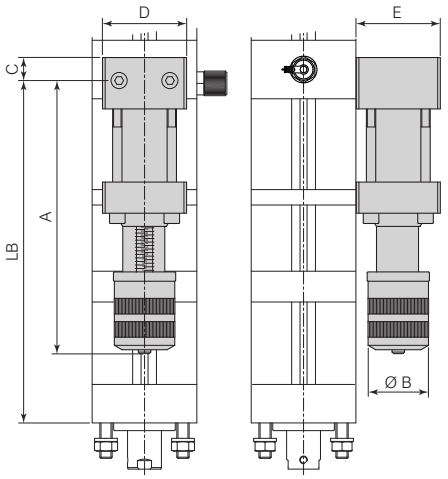
VARIABLE "K" TO CALCULATE: "LA", "LB", "LT"
K= (total stroke x 2) + (total stroke / 4)

Bore	Ø A	B	B1	Ø C	Ø D	E	F	G	H	I	LA	LB	LC	LT	L2	LD	LV	L4	□ M	M2
mm	f7			d11	H8															
50	22	M10 x 1,5	M5	40	12	6	30	M8	14	13	175,5 + K	178,5 + K	178,5 + K	191,5 + K	10	Total stroke	80 + Total stroke	11	68	139,5
63	30	M12 x 1,5	M6	50	16	8	40	M10	18	20	196,5 + K	196,5 + K	196,5 + K	215,5 + K	15	Total stroke	86 + Total stroke	14	78	159,5
80	40	M16 x 1,5	M8	65	20	10	50	M12	22	20	198,5 + K	198,5 + K	198,5 + K	217,5 + K	16,5	Total stroke	86 + Total stroke	16	98	199,5
100	60	M20 x 1,5	M8	90	25	12	60	M16	28	22	220 + K	220 + K	220 + K	239 + K	14	Total stroke	103,5 + Total stroke	14	128	259,5
125	60	M20 x 1,5	M8	110	25	12	60	M20	28	22	236 + K	236 + K	236 + K	255 + K	20	Total stroke	103,5 + Total stroke	20	149	299,5

Bore	□ N	P	Q	R	S	Sw1	Sw2	T	U1	U2	U3		U4	V	W
mm											HLU-HPU-HRU	HLX-HPX-HRX			
50	50	25	117 + (2 x Y x Work stroke)	Gas 1/4"	23	Ch 20	Ch 13	50	12,5	85 + Total stroke	37 + Work stroke	40 + Work stroke	10	5	12
63	61	30	126 + (2 x Y x Work stroke)	Gas 3/8"	29	Ch 27	Ch 16	60	15	87 + Total stroke	36,5 + Work stroke	27 + Work stroke	12	15	13
80	75	30	137,5 + (2 x Y x Work stroke)	Gas 3/8"	34	Ch 36	Ch 18	60	18	87 + Total stroke	34 + Work stroke	33 + Work stroke	12	25	13
100	91	30	140 + (2 x Y x Work stroke)	Gas 1/2"	51	Ø8,5 (x2)	Ch 24	70	17,5	96,5 + Total stroke	37,5 + Work stroke	37,5 + Work stroke	14	26	18
125	110	30	158 + (2 x Y x Work stroke)	Gas 1/2"	55	Ø8,5 (x2)	Ch 30	70	20	111,5 + Total stroke	37,5 + Work stroke	37,5 + Work stroke	14	26	18

LIMITATORI DELLA CORSA

... V
Valve to limit the work stroke (1)

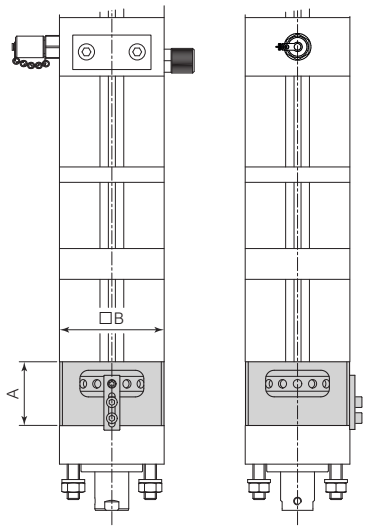


Bore mm	A	Ø B	LB	C	D	E
50	180	40	See "LB" page 2.4.05.10 - 2.4.05.11	13	54	54
63	190	40	See "LB" page 2.4.05.10 - 2.4.05.11	13	54	54
80	200	45	See "LB" page 2.4.05.10 - 2.4.05.11	13	59	59
100	240	60	See "LB" page 2.4.05.10 - 2.4.05.11	15	78	78
125	260	70	See "LB" page 2.4.05.10 - 2.4.05.11	15	95	95

(1) Option valid just for HLU, HLX, HPU, HPX

Caps, ring and rod in steel C45 manganese phosphatized – Profiled tube in E355 grey painted

... M
Mechanical total stroke regulation (1)



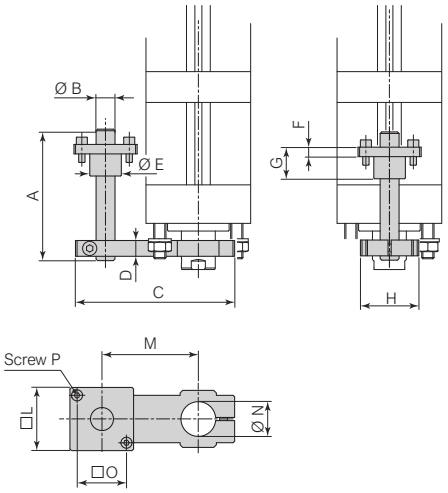
Bore mm	A	□ B
50	50 + stroke regulation	68
63	50 + stroke regulation	78
80	50 + stroke regulation	98
100	55 + stroke regulation	128
125	55 + stroke regulation	149

(1) Option valid just for HLU, HLX, HPU, HPX

Cap, Testata e regulation screw in steel C45 manganese phosphatized

OPTIONS

... A
Antirotation group

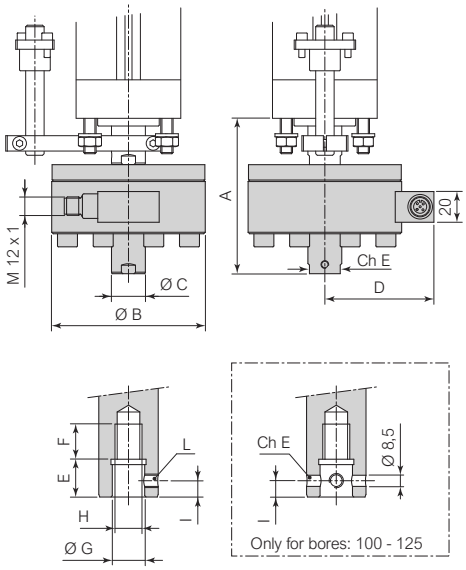


Bore mm	A	Ø B f7	C	D	Ø E	F
50	46 + Total stroke	12	103	10	24	6
63	46 + Total stroke	12	115	15	24	6
80	55 + Total stroke	16	146	20	28	6
100	55 + Total stroke	20	174	20	35	6
125	67 + Total stroke	25	199,5	25	36	6

Bore mm	G	H	□ L	M	Ø N H8	□ O	Vite P
50	20	30	40	61	22	25	M4x12
63	20	40	40	70	30	25	M4x12
80	20	50	45	90	40	30	M4x16
100	25	80	50	104	60	38	M6x16
125	30	100	50	117	80	38	M6x16

Flange, guide and screws in white zinc plated steel - Rod in C45 grounded and hard chromium plated

... E ...L ...C ...F
Load cell group



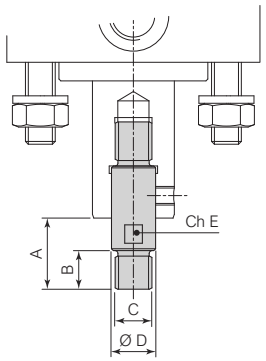
	Bore mm	Type	Force daN	A	Ø B	Ø C f7	D	E	F	Ø G H7	H	I	L	Ch E
HLU - HPU - HRU	50	...E	2500	101	100	25	71	14	14	12	M10 x 1,5	8	M6	Ch 23
	63	...E	2500	111	100	30	71	18	15	15	M12 x 1,5	8	M6	Ch 23
	80	...L	5000	126	127	47	85,5	22	18	20	M16 x 1,5	9	M8	Ch 32
	100	...C	10000	146	127	60	85,5	28	22	25	M20 x 1,5	12	M8	Ø8,5 (x2)
	125	...F	20000	170	165	60	105,5	28	22	25	M20 x 1,5	12	M8	Ø8,5 (x2)

	Bore mm	Type	Force daN	A	Ø B	Ø C	D	E	F	Ø G	H	I	L	Ch E Ch
HLX - HPX - HRX	50	...E	2500	101	100	25	71	14	14	12	M10 x 1,5	8	M6	Ch 23
	63	...L	5000	113	127	40	85,5	18	15	16	M12 x 1,5	8	M6	Ch 32
	80	...C	10000	126	127	47	85,5	22	18	20	M16 x 1,5	9	M8	Ch32
	100	...C	10000	146	127	60	85,5	28	22	25	M20 x 1,5	12	M8	Ø8,5 (x2)
	125	...F	20000	170	165	60	105,5	28	22	25	M20 x 1,5	12	M8	Ø8,5 (x2)

Load cell in stainless steel - Flange in white zinc plated steel - Adaptor in white zinc plated steel.

For the technical features of the load cell see page 2.4.05.18

... C
Male shank

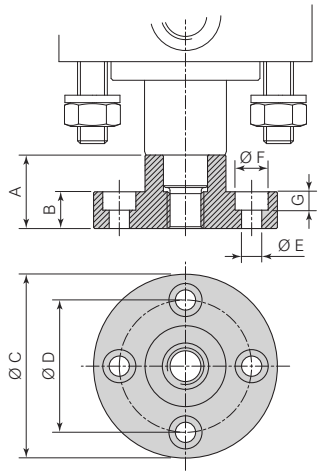


Bore mm	A	B	C	Ø D f7	Ch E Ch
50	19,5	10,5	M10 x 1,5	12	11
63	23	12	M12 x 1,5	16	13
80	33	16	M16 x 1,5	20	17
100	38	20	M20 x 1,5	25	22
125	38	20	M20 x 1,5	25	22

Male shank in steel C45

OPTIONS

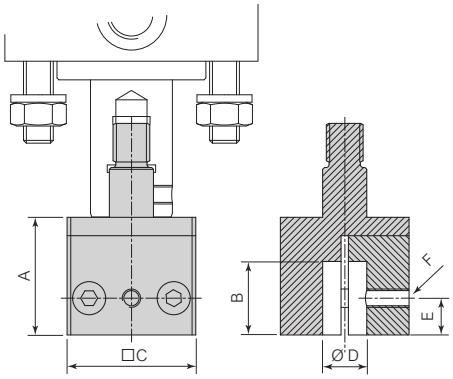
... M
Shank and mouldholder hub



Bore mm	A	B	Ø C	Ø D	Ø E	Ø F	G
50	20	10	50	36	5,5	9	5
63	25	12	59	46	6,5	10,5	6
80	35	15	78	60	8,5	13,5	8
100	40	20	98	78	8,5	13,5	8
125	40	20	118	98	8,5	13,5	8

Mouldholder hub in steel C45 white zinc plated

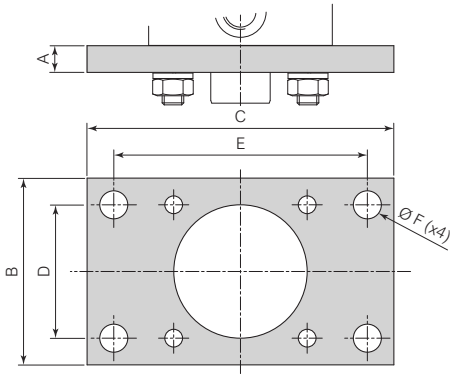
... R
Radial mouldholder



Bore mm	A	B $^{+0,5}_{0}$	□ C	Ø D H7	E	F
50	32	20	35	12	10	M5 x 0,8
63	34	18	50	16	9	M6 x 1
80	35	22	50	20	10	M8 x 1,25
100	50	28	60	25	12	M8 x 1,25
125	50	28	80	25	12	M8 x 1,25

Radial mouldholder in steel C45 white zinc plated

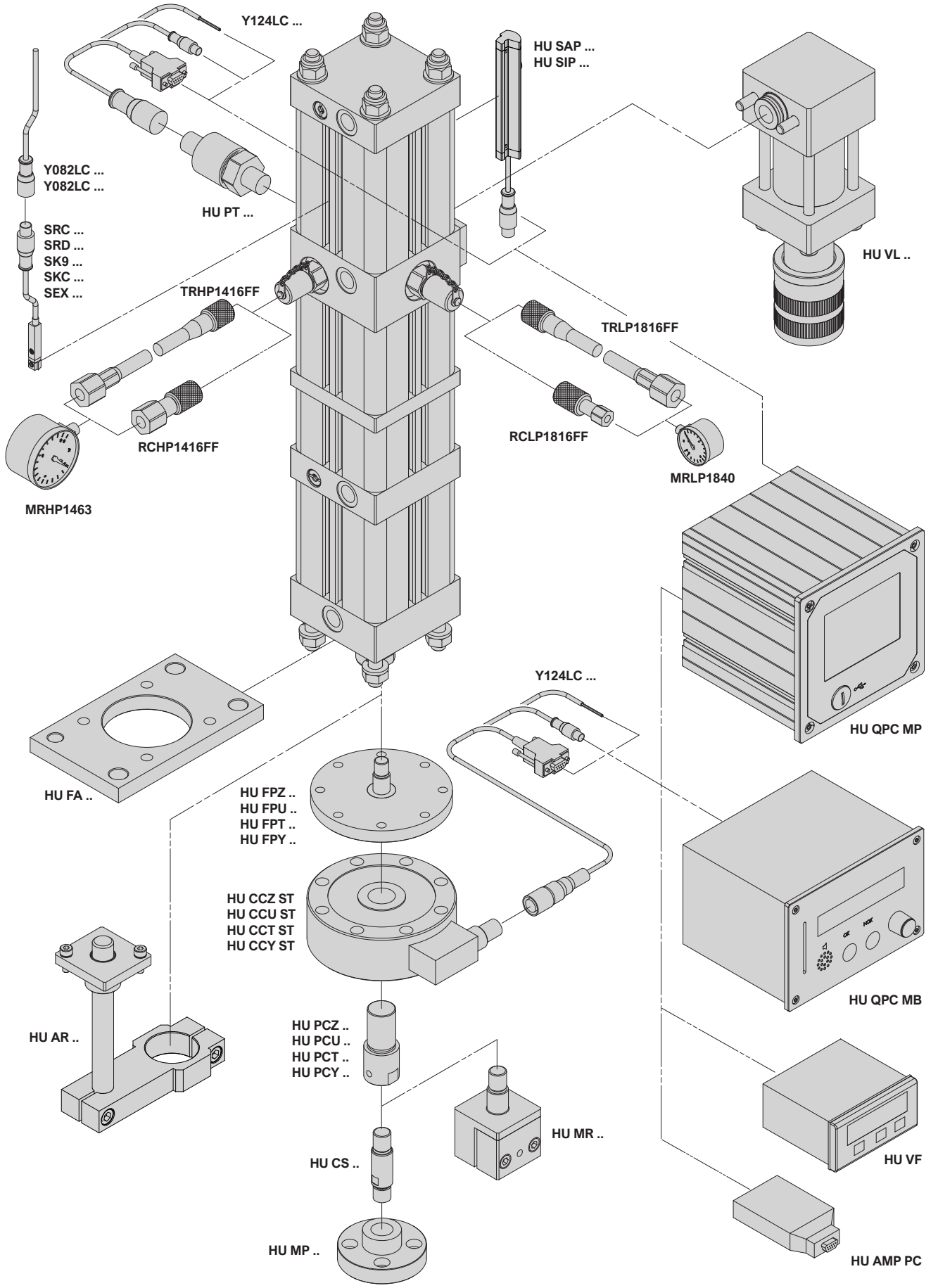
... F
Front fixing flange



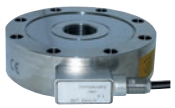
Bore mm	A	B	C	D	E	Ø F
50	10	70	115	50	95	10,5
63	12	80	135	61	110	10,5
80	15	100	165	75	135	12,5
100	20	130	200	100	170	17
125	25	150	240	110	200	21

Front flange in steel Fe430 white zinc plated

ACCESSORIES



ACCESSORIES

	HU CC. ST Load cell with DATA INTERFACE		**HU FP. ..** Flange group for load cell		**HU PC. ..** Adaptor for load cell		**HU AR. ..** Antirotation group
							
Ø	Page 2.4.05.16	Page 2.4.05.16	Page 2.4.05.17	Page 2.4.05.17	Page 2.4.05.17	Page 2.4.05.17	Page 2.4.05.17
50	HU CCZ ST	HU CCZ ST	HU FPZ 19	HU FPZ 19	HU PCZ 19	HU PCZ 19	HU AR 19 ... (total stroke)
63	HU CCZ ST	HU CCU ST	HU FPZ 20	HU FPZ 20	HU PCZ 20	HU PCZ 20	HU AR 20 ... (total stroke)
80	HU CCU ST	HU CCT ST	HU FPU 21	HU FPU 21	HU PCU 21	HU PCU 21	HU AR 21 ... (total stroke)
100	HU CCT ST	HU CCT ST	HU FPT 22	HU FPT 22	HU PCT 22	HU PCT 22	HU AR 22 ... (total stroke)
125	HU CCY ST	HU CCY ST	HU FPY 23	HU FPY 23	HU PCY 23	HU PCY 23	HU AR 23 ... (total stroke)
	HLU - HPU - HRU	HLX - HPX - HRX	HLU - HPU - HRU	HLX - HPX - HRX	HLU - HPU - HRU	HLX - HPX - HRX	
	Load cellr in stainless steel		Zinc plated steel		Zinc plated steel		Flange, guide and screws in zinc plated steel. Rod in steel chromium plated

	HU CS .. Male shank	**HU MP ..** Mould holder hub	**HU MR ..** Radial mould holder	**HU FA ..** Front fixing flange		**HU VL ..** Limit valve	
							
Ø	Page 2.4.05.18	Page 2.4.05.18	Page 2.4.05.18	Page 2.4.05.18		Page 2.4.05.19	
50	HU CS 19	HU MP 19	HU MR 19	HU FA 19		HU VL 19	
63	HU CS 20	HU MP 20	HU MR 20	HU FA 20		HU VL 20	
80	HU CS 21	HU MP 21	HU MR 21	HU FA 21		HU VL 21	
100	HU CS 22	HU MP 22	HU MR 22	HU FA 22		HU VL 22	
125	HU CS 23	HU MP 23	HU MR 23	HU FA 23		HU VL 23	
	Steel C45	Steel C45 white zinc plated	Steel C45 white zinc plated	Steel FE 430 white zinc plated		Steel C45 phosphated Fe355 grey painted	

MRLP1840 Gauge low pressure	**MRHP1463** Gauge high pressure	**RCLP1816FF** Gauge adapter low pressure	**RCHP1416FF** Gauge adapter high pressure	**TRLP1816FF** Gauge adapter pipe low pressure	**TRHP1416FF** Gauge adapter pipe high pressure		**MRP200** Manual oil refill pump
							
Page 2.4.05.20	Page 2.4.05.20	Page 2.4.05.20	Page 2.4.05.20	Page 2.4.05.21	Page 2.4.05.21		Page 2.4.05.23
Case: Painted steel Screen: Plexiglass Movements: Brass	Case: Stainless steel Screen: Plexiglass Movements: Brass	Adapter: Zinc plated steel Seals: NBR	Adapter: Zinc plated steel Seals: NBR	Adapter: Zinc plated steel Seals: NBR Pipe: Polyurethane	Adapter: Zinc plated steel Seals: NBR Pipe: Polyurethane		Pump: ABS, steel Adapter: Brass Pipe: Rilsan

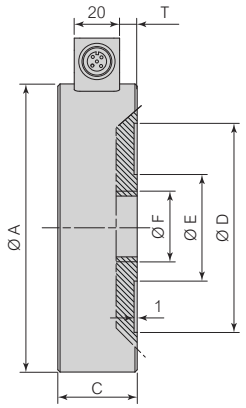
HU QPC MP Process control FORCE-DISPLACEMENT	**HU QPC MB** Process control FORCE	**HU VF** Digital transmitter FORCE	**HU AMP PC** Digital transmitter FORCE		**HU SAP ...** Position transducer ANALOG	**HU SIP ...** Position transducer IO-LINK	**HU PT ...** Pressure transducer ANALOG
							
Page 2.4.05.22	Page 2.4.05.23	Page 2.4.05.24	Page 2.4.05.25		Page 2.4.05.26	Page 2.4.05.26	Page 2.4.05.27
Box in aluminium	Box in aluminium	Box in ABS	Box in ABS		Sensor: ENGINEERING POLYMER Cable: PUR	Sensor: ENGINEERING POLYMER Cable: PUR	Body: Stainless steel Cable: PVC

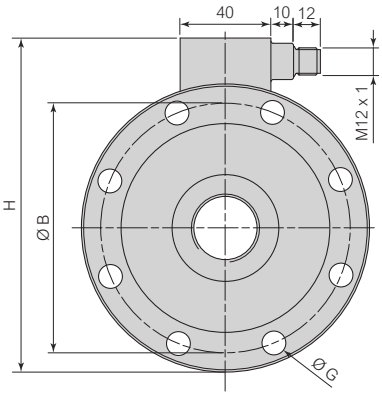
SRC .. Sensor NO REED - 2 poles	**SRD ..** Sensor NO REED - 3 poles	**SRN ..** Sensor NO HALL - 3 poles	**SK9 ..** Sensor IP69K NO HALL - 3 poles	**SKC ..** Sensor precise position HALL - 3 poles	**Y082LC....** Straight connectors M8 x 1 - 2 poles	**Y083LC....** Straight connectors M8 x 1 - 3 poles	**Y124LC....** Straight connectors M12 x 1 - 4 poles
							
Page 2.4.05.28	Page 2.4.05.28	Page 2.4.05.28	Page 2.4.05.29	Page 2.4.05.29	Page 2.4.05.30	Page 2.4.05.30	Page 2.4.05.30
Sensor: PA6 Cable: PUR	Sensor: PA6 Cable: PUR	Sensor: PA6 Cable: PUR	Sensor: PA6 Cable: PUR	Sensor: PA Cable: PUR	Connector: PVC Contacts: golden brass Cable: PVC	Connector: PVC Contacts: golden brass Cable: PVC	Connector: PVC Contacts: golden brass Cable: PVC

ACCESSORIES

HU CC. ST

Load cell with DATA INTERFACE

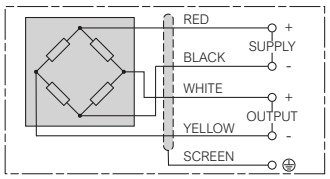




Load cell at compression to measure static loads connected to units of **series H - KRATOSPACK**.

They can be supplied with calibration certificate: all the load cells of the **series HU CC. ST** can be connected to a controller of process to handle the work cycle.

(See from page 2.4.05.22 to 2.4.05.25)



	Bore mm	Code	Force daN	Ø A	Ø B	C	Ø D	Ø E	F	Ø G	H	T
HLU - HPU - HRU	50	HU CCZ ST	2500	100	86	35	72	32	M20 x 1,5	9 (x6)	121	7,5
	63	HU CCZ ST	2500	100	86	35	72	32	M20 x 1,5	9 (x6)	121	7,5
	80	HU CCU ST	5000	127	110	35	94	47	M30 x 2	10,5 (x8)	149	7,5
	100	HU CCT ST	10000	127	110	35	94	47	M30 x 2	10,5 (x8)	149	7,5
	125	HU CCY ST	20000	165	138	50	108	62	M42 x 3	17 (x12)	188	15

	Bore mm	Code	Force daN	Ø A	Ø B	C	Ø D	Ø E	F	Ø G	H	T
HLX - HPX - HRX	50	HU CCZ ST	2500	100	86	35	72	32	M20 x 1,5	9 (x6)	121	7,5
	63	HU CCU ST	5000	127	110	35	94	47	M30 x 2	10,5 (x8)	149	7,5
	80	HU CCT ST	10000	127	110	35	94	47	M30 x 2	10,5 (x8)	149	7,5
	100	HU CCT ST	10000	127	110	35	94	47	M30 x 2	10,5 (x8)	149	7,5
	125	HU CCY ST	20000	165	138	50	108	62	M42 x 3	17 (x12)	188	15

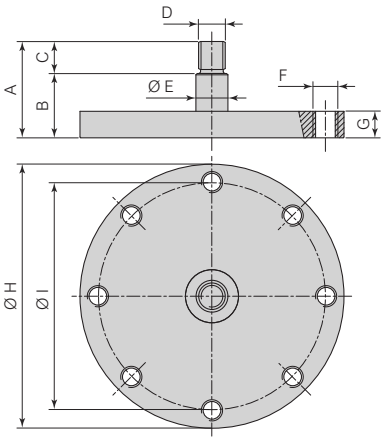
TECHNICAL FEATURES

Force (daN)		2500	5000	10000	20000
Relative errors	**Repeatability 0°-120°240°** (b)	≤ ± 0,145 % (1)			
	Interpolation (fc)	≤ ± 0,090 % (1)			
	Reversibility (u)	≤ ± 0,240 % (1)			
	Zero (fo)	≤ ± 0,030 %			
Linearity / Isteresis		≤ ± 0,05 %			
Temperature effect (10°C)	**On zero**	≤ ± 0,028 %			
	On sensitivity	≤ ± 0,024 %			
Effect of transverse load at 10% of nominal load		≤ ± 0,030 %			
Nominal sensitivity		2 mV/V (2)			
Sensitivity tolerance		≤ ± 0,1 %			
Input resistance		800 ± 20 Ω			
Output resistance		705 ± 2 Ω			
Insulation resistance		> 5 GΩ			
Zero balance		≤ ± 1%			
Recomended supply voltage		10 V			
Nominal supply voltage range		1 ÷ 15 V (max 18 V)			
Mechanical limit values referred to nominal load	**Service load**	120 %			
	Max permissible load	150 %			
	Breaking load	> 300 %			
	Max transverse load	100 %			
	Max permissible dynamic load	75 % (3)			
Displacement at nominal load		~ 0,06 mm	~ 0,06 mm	~ 0,17 mm	~ 0,17 mm
Working temperature		-10°C ÷ +70°C			
Weight		~ 1,6 kg	~ 1,6 kg	~ 2,5 kg	~ 2,5 kg
Protection class (IEC 60529)		IP67			
Materials		Load cell in stainless steel - Connector M12x1 in steel			

(1) Percentage errors referred to reading, min. 1/10 of nominal load.
(2) Tests and calibrations performed in COMPRESSION with the transducer mounted on a bearing support with correctly tightened clamping screws.
(3) The dynamic load must be applied to the transducer central thread and not to the external fixing rim.

ACCESSORIES

HU FP. ..
Flange group for load cell

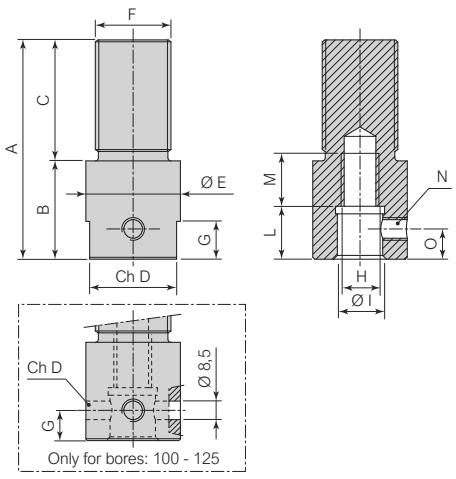


	Bore mm	Code	A	B	C	D	Ø E f8	F	G	Ø H	Ø I
HLU - HPU - HRU	50	HU FPZ 19	35,5	23,5	12	M10 x 1,5	12	M8 (x6)	10	99,5	86
	63	HU FPZ 20	42	28	14	M12 x 1,5	16	M8 (x6)	10	99,5	86
	80	HU FPU 21	51	33	18	M16 x 1,5	20	M10 (x8)	12	127	110
	100	HU FPT 22	62	40	22	M20 x 1,5	25	M10 (x8)	15	127	110
	125	HU FPY 23	71	49	22	M20 x 1,5	25	M16 (x12)	24	165	138

	Bore mm	Code	A	B	C	D	Ø E f8	F	G	Ø H	Ø I
HLX - HPX - HRX	50	HU FPZ 19	35,5	23,5	12	M10 x 1,5	12	M8 (x6)	10	99,5	86
	63	HU FPU 20	44	30	14	M12 x 1,5	16	M10 (x8)	12	127	110
	80	HU FPT 21	51	33	18	M16 x 1,5	20	M10 (x8)	12	127	110
	100	HU FPT 22	62	40	22	M20 x 1,5	25	M10 (x8)	15	127	110
	125	HU FPY 23	71	49	22	M20 x 1,5	25	M16 (x12)	24	165	138

Flange in zinc plated steel / 1 piece each package

HU PC. ..
Adaptor for load cell

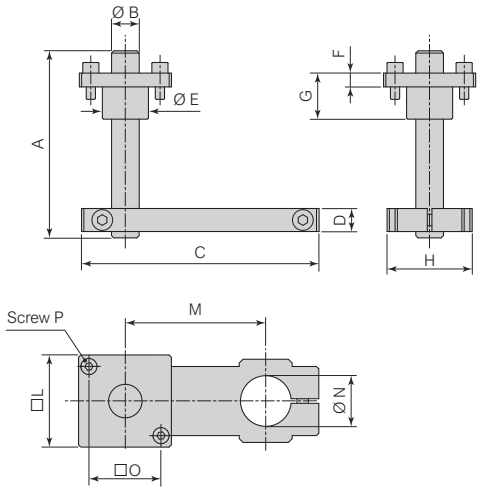


	Bore mm	Code	A	B	C	D Ch	Ø E	F	G	H	Ø I H7	L	M	N	O
HLU - HPU - HRU	50	HU PCZ 19	58	26	32	23	25	M20 x 1,5	9	M10 x 1,5	12	14	14	M6	8
	63	HU PCZ 20	58	26	32	27	30	M20 x 1,5	9	M12 x 1,5	16	18	15	M6	8
	80	HU PCU 21	61	29	32	32	47	M30 x 2	10	M16 x 1,5	20	22	18	M8	9
	100	HU PCT 22	68	36	32	Ø8,5 (x2)	60	M30 x 2	12	M20 x 1,5	25	28	22	M8	12
	125	HU PCY 23	81	36	45	Ø8,5 (x2)	60	M42 x 3	12	M20 x 1,5	25	28	22	M8	12

	Bore mm	Code	A	B	C	D Ch	Ø E	F	G	H	Ø I H7	L	M	N	O
HLX - HPX - HRX	50	HU PCZ 19	58	26	32	23	25	M20 x 1,5	9	M10 x 1,5	12	14	14	M6	8
	63	HU PCU 20	58	26	32	36	40	M30 x 2	9	M12 x 1,5	16	18	15	M6	8
	80	HU PCT 21	61	29	32	32	47	M30 x 2	10	M16 x 1,5	20	22	18	M8	9
	100	HU PCT 22	68	36	32	Ø8,5 (x2)	60	M30 x 2	12	M20 x 1,5	25	28	22	M8	12
	125	HU PCY 23	81	36	45	Ø8,5 (x2)	60	M42 x 3	12	M20 x 1,5	25	28	22	M8	12

Adaptor in zinc plated steel / 1 piece each package

HU AR .. ...
Antirotation group



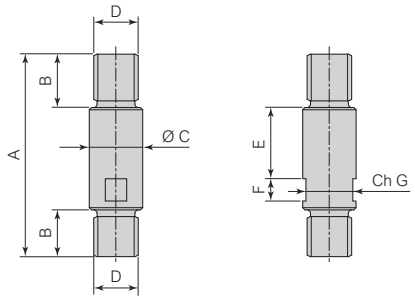
Bore mm	Code	A	Ø B f7	C	D	Ø E	F
50	HU AR 19 ... (total stroke)	46 + Total stroke	12	103	10	24	6
63	HU AR 20 ... (total stroke)	46 + Total stroke	12	115	15	24	6
80	HU AR 21 ... (total stroke)	55 + Total stroke	16	146	20	28	6
100	HU AR 22 ... (total stroke)	55 + Total stroke	20	174	20	35	6
125	HU AR 23 ... (total stroke)	67 + Total stroke	25	199,5	25	36	6

Bore mm	Code	G	H	□ L	M	Ø N H8	□ O	Screw P
50	HU AR 19 ... (total stroke)	20	30	40	61	22	25	M4x12
63	HU AR 20 ... (total stroke)	20	40	40	70	30	25	M4x12
80	HU AR 21 ... (total stroke)	20	50	45	90	40	30	M4x16
100	HU AR 22 ... (total stroke)	25	80	50	104	60	38	M6x16
125	HU AR 23 ... (total stroke)	30	100	50	117	80	38	M6x16

Flange, guide and screws in white zinc plated steel - Rod in C45 chromium plated / 1 piece each package

ACCESSORIES

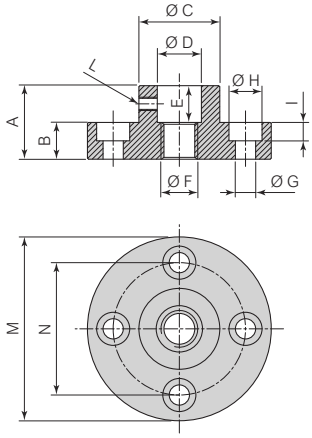
HU CS ..
Male shank



Bore mm	Code	A	B	Ø C f7	D	E	F	G Ch
50	HU CS 19	45,5	12	12	M10 x 1,5	16	5	11
63	HU CS 20	53	14	16	M12 x 1,5	20	6	13
80	HU CS 21	71	18	20	M16 x 1,5	25	7	17
100	HU CS 22	86	22	25	M20 x 1,5	30	8	22
125	HU CS 23	86	22	25	M20 x 1,5	30	8	22

Male shank in steel C45 / 1 piece each package

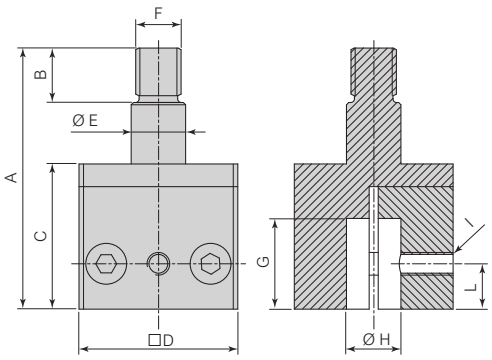
HU MP ..
Mouldholder hub



Bore mm	Code	A	B	Ø C	Ø D H7	E	F	Ø G	Ø H	I	L	M	N
50	HU MP 19	20	10	22	12	10	M10 x 1,5	5,5	9	5	M5	50	36
63	HU MP 20	25	12	30	16	12	M12 x 1,5	6,5	10,5	6	M6	59	46
80	HU MP 21	35	15	40	20	18	M16 x 1,5	8,5	13,5	8	M8	78	60
100	HU MP 22	40	20	60	25	19	M20 x 1,5	8,5	13,5	8	M8	98	78
125	HU MP 23	40	20	80	25	19	M20 x 1,5	8,5	13,5	8	M8	118	98

Mouldholder hub in C45 white zinc plated steel / 1 piece each package

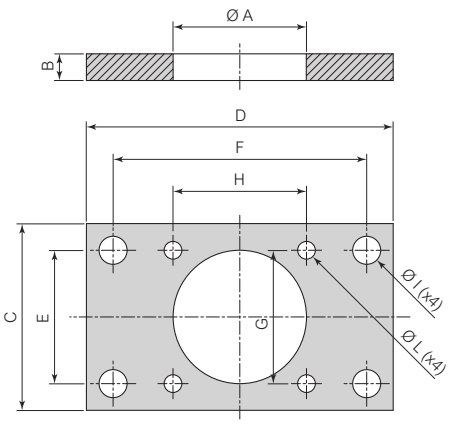
HU MR ..
Radial mouldholder



Bore mm	Code	A	B	C	□ D	Ø E f7	F	G	Ø H H7	I	L
50	HU MR 19	58	12	27	35	12	M10 x 1,5	20	12	m5	10
63	HU MR 20	66	14	34	50	16	M12 x 1,5	18	16	M6	9
80	HU MR 21	74	18	35	50	20	M16 x 1,5	22	20	M8	10
100	HU MR 22	97	22	50	60	25	M20 x 1,5	28	25	M8	12
125	HU MR 23	97	22	50	80	25	M20 x 1,5	28	25	M8	12

Radial mouldholder in C45 white zinc plated steel / 1 piece each package

HU FA ..
Front fixing flange



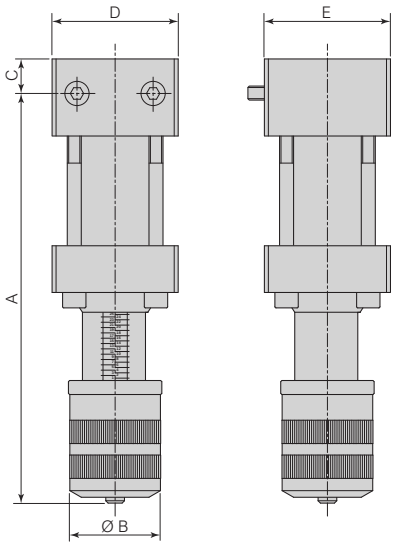
Bore mm	Code	Ø A H11	B	C	D	E	F	G	H	Ø I	Ø L
50	HU FA 19	50	10	70	115	50	95	50	50	10,5	8,5
63	HU FA 20	50	12	80	135	61	110	61	61	10,5	10,5
80	HU FA 21	70	15	100	165	75	135	75	75	12,5	12,5
100	HU FA 22	90	20	130	200	100	170	100	100	17	17
125	HU FA 23	110	25	150	240	110	200	110	110	21	21

Front fixing flange in Fe430 white zinc plated steel / 1 piece each package

ACCESSORIES

HU VL ..

Valve to limit the work stroke [1]



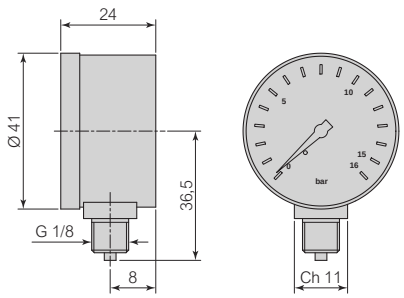
Bore mm	Code	A	Ø B	C	D	E
50	HU VL 19	180	40	13	54	54
63	HU VL 20	190	40	13	54	54
80	HU VL 21	200	45	13	59	59
100	HU VL 22	240	60	15	78	78
125	HU VL 23	260	70	15	95	95

[1] Option availlable only on the units series HLU, HLX, HPU, HPX

Caps, ring and rod in steel C45 manganese phosphatized – Profiled tube in E355 grey painted / 1 piece each package

GAUGES

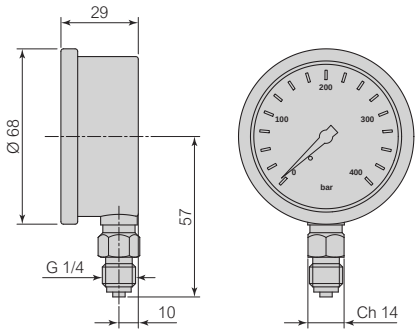
MRLP1840
Low pressure gauge



Technical features	
Code	MRLP1840
Threaded connection	Gas 1/8" (ISO 228)
Scale	0 ÷ 16 bar
Overpressure	25% max
Accuracy	C.L. 2,5 - 1,6%
Working temperature	-15°C ÷ +60°C
Protection class (IEC 60529)	IP55
According to standards	UNI EN 837.1
Internal fluid	None

MRLP1840 / Black steel painted case, plexiglass screen, brass movements - 1 piece each package

MRHP1463
High pressure gauge

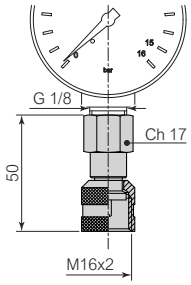


Technical features	
Code	MRHP1463
Threaded connection	Gas 1/4" (ISO 228)
Scale	0 ÷ 400 bar
Overpressure	15% max
Accuracy	C.L. 2,5 - 1,0%
Working temperature	-10°C ÷ +60°C
Protection class (IEC 60529)	IP55
According to standards	UNI EN 837.1
Internal fluid	Glycerine

MRHP1463 / Case in stainless steel AISI 304, plexiglass screen, brass movements - 1 piece each package

ADAPTERS FOR MR.. GAUGE

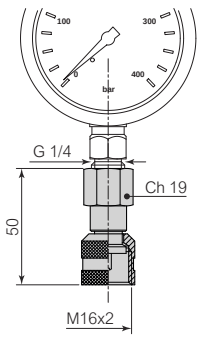
RCLP1816
Low pressure gauge adapter



Technical features	
Code	RCLP1816
Threaded connection	Gas 1/8" (ISO 228)
Test coupling connection	M16x2
Max. pressure	630 bar
Working temperature	-30°C ÷ +125°C

RCLP1816 / Adapter in zinc plated carbon steel, NBR seals - 1 piece each package

RCHP1416
High pressure gauge adapter

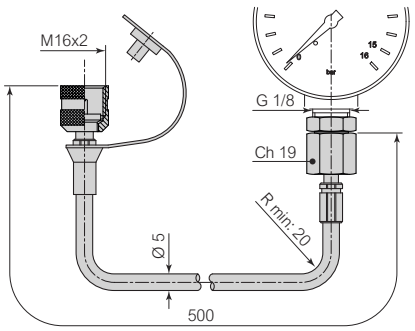


Technical features	
Code	RCHP1416
Threaded connection	Gas 1/4" (ISO 228)
Test coupling connection	M16x2
Max. pressure	630 bar
Working temperature	-30°C ÷ +125°C

RCHP1416 / Adapter in zinc plated carbon steel, NBR seals - 1 piece each package

ADAPTER PIPES FOR MR.. GAUGE

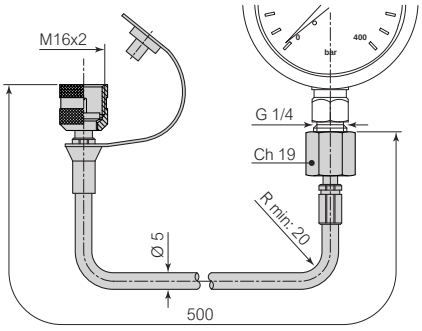
TRLP1816FF
Low pressure gauge adapter pipe



Technical features	
Code	TRLP1816FF
Threaded connection (1)	Gas 1/8" (ISO 228)
Test coupling connection (1)	M16x2
Pipe length (1)	500 mm
Inside diameter of the pipe	2,2 mm
Min. bending radius	20 mm
Max. pressure	630 bar
Working temperature	-40°C ÷ +100°C

TRLP1816FF / Adapter in zinc plated carbon steel, NBR seals, pipe in antiabrasion polyurethane - 1 piece each package

TRHP1416FF
High pressure gauge adapter pipe



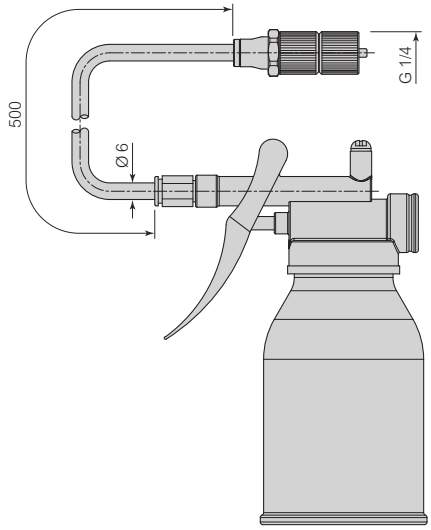
Technical features	
Code	TRHP1416FF
Threaded connection (1)	Gas 1/4" (ISO 228)
Test coupling connection (1)	M16x2
Pipe length (1)	500 mm
Inside diameter of the pipe	2,2 mm
Min. bending radius	20 mm
Max. pressure	630 bar
Working temperature	-40°C ÷ +100°C

TRHP1416FF / Adapter in zinc plated carbon steel, NBR seals, pipe in antiabrasion polyurethane - 1 piece each package

(1) Different types of fittings and tube lengths available on request

MANUAL REFILL PUMP MRP200

MRP200
Manual oil refill pump



Technical features	
Code	MRP200
Threaded connection	Gas 1/4" (ISO 228)
Pipe length (2)	500 mm
Inside diameter of the pipe	4 mm
Tank capacity	200 ml

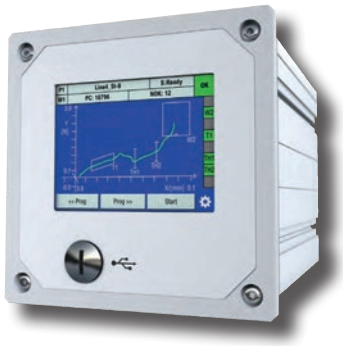
MRP200 / Body in ABS, tank and lever in carbon steel, pipe in Rilsan, NBR seals - 1 piece each package

(2) Different tube lengths available on request

PROCESS CONTROLS

HU QPC MP

Process control FORCE - DISPLACEMENT - TIME

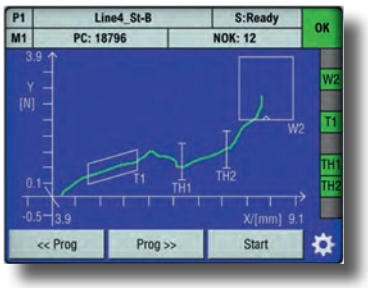


Process control force - displacement - time that allows the measurement and the control of physical parameters characteristic of the piece being machining.

The device is particularly suitable for the automatic verification of the process in cases where the pressing operations must comply with parameters set by the quality system.

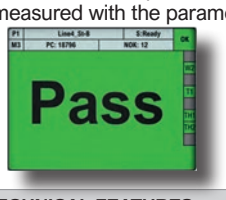
Programmed by the customer, the device allows, for example, to check the correct driving force in relation to the displacement.

During the measurement phase, the forces in relation to the displacements are measured synchronously and are saved in the measurement data memory.



The signals, coming from the load cell and processed in real time, can indicate if the measures are compliant or if they exceed the levels set while the measurement is still in progress.

In the evaluation phase, following the measurement phase, the instrument compares the data just measured with the parameters set by the customer showing them on the screen with a graphic curve.



If any of these parameters are non-compliant:
the instrument identifies the cycle as NOT OK, otherwise it will be classified as OK.

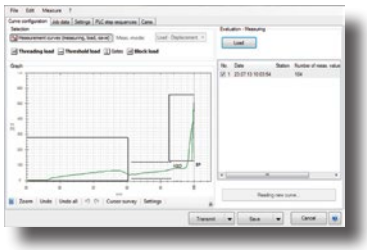
The work cycles and the records can be saved and transferred on an external USB memory or sent directly by the EtherNet network.

TECHNICAL FEATURES		
Code		HU QPC MP
Measurement channels		Force / Displacement / Time
Sampling rate		10 kHz
Digitalization		16 bit
Evaluation time		25 ms
Measurement programs		16
Power supply	**Voltage**	100 ÷ 240 Vac
	Voltage tolerance	± 10 %
	Frequency	50 ÷ 60 Hz
	Frequency tolerance	± 10 %
	Power consumption	< 15 VA
Working temperature		+5°C ÷ +40°C
Protection class (IEC 60529)		IP40 - IP65 (panel-mounted)
Touch screen		LCD 3,5" - TFT color (320x240)
Operating language		German, English, French, Italian, Spanish, Chinese
Compatible sensors		Flexible assigment of physical channels A ... B to measurement graphs (X / Y coordinates)
Channel A (Displacement sensor)	**Excitation voltage**	5 V
	Excitation current	10 mA (max.)
	Signal range	± 5 V - ± 10 V
	Cut-off frequency	5 ÷ 5000 Hz
	Total error	< 0,2%
Channel B (Load cell)	**Excitation voltage**	5 V
	Excitation current	30 mA (max.)
	Signal range	± 5 V - ± 10 V
	Cut-off frequency	5 ÷ 5000 Hz
	Total error	< 0,2%
	Signal range	2 / 4 / 10 /20 / 40 mV/V
	Bridge resistance	120 Ω ÷ 5000 Ω
I/O interfaces		Parallel PLC port according to EN 61131-2, 24Vdc opto-insulated, positive logic D-SUB-25 female 10 inputs, of which 3 are configurable 13 output, of which 6 are configurable
Communication interfaces		USB slave port on front panel (type micro-B) USB master port on rear panel (type A) Ethernet 10/100 MBit (RJ45)
Materials		Box in aluminium
Dimensions		110x110x183 (Front panel 119x119)
Weight		~ 1,5 kg

PROCESS CONTROLS

HU QPC MB

Process control FORCE - TIME



Simple process controller that ensures the measurement and the direct control of the FORCE.

The controller was developed specifically for the manual pressing monitoring. Thanks to its single control button and the autoconfiguration process: any semi-qualified operator can set the instrument quickly.

With the smart card programming system the customer can: set the equipment, inhibit unauthorized modifications and activate actions in sequence for the production process.

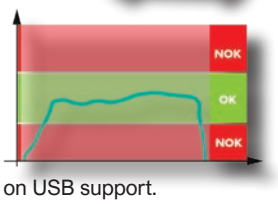
Through two lights controls: green and red, the instrument identifies the work cycle OK or NOT OK. An acoustic warning indicates the part NOT OK.

On request, it is also available the version to control FORCE / DISPLACEMENT.

The instrument is equipped with an internal PLC with functions that guarantee the control up to 60 sequences.

The customer can program the sequences to automate the work cycle, handling the working pieces and manage good pieces from scrap pieces.

The PC software, supplied with the instrument, can be integrated to analyse the curve and give a fine-tune for the evaluation elements.



The software can storage the measurement curves and archive them on USB support.

TECHNICAL FEATURES		
Code		HU QPC MB
Measurement channels		Force / Time - (On request: Force / Displacement)
Sampling rate		10 kHz
Evaluation time		1 ms
Power supply	**Voltage**	90 ÷ 240 Vac
	Voltage tolerance	± 10 %
	Frequency	50 ÷ 60 Hz
	Frequency tolerance	± 10 %
	Power consumption	1,5 A (max.)
Working temperature		+5°C ÷ +40°C
Protection class (IEC 60529)		IP20
Display		2 line illuminated LCD
Warning sound		Configurable signal type
Alarm signal volume		Up to 75 dB
Force channel (Load cell)	**Excitation voltage**	5 V
	Excitation current	20 mA
	Signal range	1 ÷ 10 mV
	Connection type	4 wires
	Total error	< 1%
	Signal range	2 / 4 / 10 /20 / 40 mV/V
	Bridge resistance	350 Ω ÷ 5000 Ω
Displacement channel (Position sensor) (optional)	**Sensor type**	Potentiometric displacement sensor
	Cut-off frequency	1 ÷ 5000 Hz
	Total error	< 1 %
I/O interfaces		8 inputs 8 outputs
Communication interfaces		USB slave port on rear panel (type B) RS-232 D-SUB 9 (19,2 kbaud data rate)
Materials		Box in aluminium
Dimensions		174x119x213 (Front panel 119x119)
Weight		~ 3 kg

PROCESS CONTROLS

HU VF

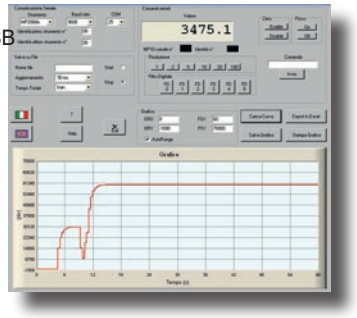
Process control FORCE - TIME

The panel digital indicator **HU VF** has been designed to be used in the modern static and dynamic measure systems of industrial field of activity.

Suitable for processing an analog signals coming from strain gauge load cells , it allows to perform measurements with a long-term accuracy of 0.01% with a resolution of ±50.000 steps at 2mV/V. Inside the instrument works with ±500.000 steps.

All the calibrations (Zero, Full Scale, Analog output, Sensibility, etc.) are digital, therefore they can be performed and repeated directly on front pannel keybord.

The instrument is equipped with OPTOINSULATED digital inputs for a remote control of: ZERO, PEAK, HOLD, UNLOAD and PRINT functions.



On request it is possible to provide the instrument with OPTOINSULATED serial outputs RS232, RS485, USB which make the indicator extremely flexible to be interfaced with advanced systems such as PC, PLC etc;

The operator interface is made by keyboard that allows the access and the programming by the customer of the functions such as:

- Storage force peaks
- Activation and deactivation programmable output
- Digital filter
- Change of resolution with increased measures (1, 2, 5, … divisions)
- Keybord lock programming through a password
- Connection at a second indicator for measurement remote display
- Automatically reset of the instrument when the measurement is lower to the programmed threshold

On request it is availlable a software that allows the connection of the digital indicator to PC through the RS232 or USB (optinal). The save function allows to storage he force-time values in text format or Microsoft Excel formats.

The test curves stored can be comparated later allowing a simultaneous comparison of the various test curves. It is possible to zoom portions of the curve, save the chart in bitmap file and print the curve.

TECHNICAL FEATURES		
Code		HU VF
Measurement channels		Force / Time
Standard resolution (2mV/V)		± 50.000 div. (Internal ± 500.000 div.)
Readings for second		max. 160
Accuracy / Linear error		≤ ± 0,01 %
Power supply	**Voltage**	230 Vac
	Voltage tolerance	± 10 %
	Frequency	50 ÷ 60 Hz
	Frequency tolerance	± 10 %
	Power consumption	10 VA
Working temperature		-10°C ÷ +50°C
Temperature variation effect (10°C)	**On zero**	≤ ± 0,005 %
	On full scale	≤ ± 0,003 %
Protection class (IEC 60529)		IP40 (pannello frontale)
Red display (high efficency)		7 segments
Display height		13 mm
Force channel (Load cell)	**Nominal feeling**	2 mV/V
	Connectable load cells	6 (350Ω) - 12 (700Ω)
	Load cell feeding	5 Vac ±4%
	Connection type	4 or 6 wires
	Transmitter feeding	15 Vdc (-4%) 50 mA
Programmable set point and hysteresis		4
Zero function		100%
Programmable digital filter		0, 1, 2, 3, 4, 5
Programmable full scale		max. ± 99,998
Programmable decimal point		Yes
Programmable resolution		1, 2, 5, 10, 20, 50, 100
Peak function		Positive, negative, disabled
Remote commands (optoinsulated)		Zero, print, peak, hold, unload
Keyboard lock function		Yes
I/O interfaces		Extractible screw terminal block
Communication interfaces		RS-232 D-SUB 9 USB (optional)
Materials		Box in ABS
Dimensions		72x144x153 (DIN 43700) - Hole gauge 68x138
Weight		~ 0,9 kg

PROCESS CONTROLS

HU AMP PC

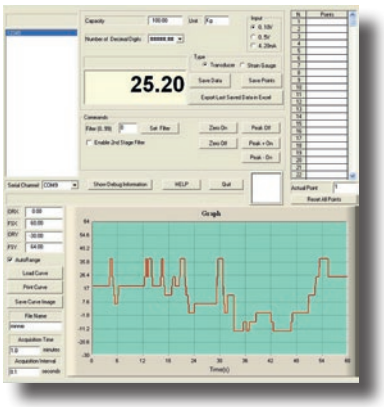
Digital transmitter FORCE - TIME

The transmitter **HU AMP PC** makes easy the connection between the load cell and a PC.
The instrument have a maximum resolution of 20.000 divisions and transmits the data directly to USB 2.0.

It is a very simple and complete instrument, it is self powered directly from the USB line and it is ideal for use as a generic acquisition system leaving to the software on PC the characterization of the parameters to which the transducer is connected.

The transmitter is controlled by a microcontroller that processes the data sampled by a high resolution AD converter at a frequency up to 3000Hz and manages the USB communication.

The transmitter continuously transmits the value in divisions according to a protocol highly optimized and easy to implement.
To make possible the visualization of the data transmitted by the load cell to the PC: the transmitter is supplied complete with DATA LOGGER for cell parameter management, to create graphs and export the measured values to an EXCEL file.



A section of the program can be personalized by the customer to adapt the measurements acquired by the transmitter to the characteristic data of the connected load cell:

- Instrument full scale
- Input signal (mV/V)
- Unit of measure
- Decimal point position

The software allows to storing the work cycle Force / Time and to visualize the related graphically curve.
Some simple commands allow to perform main functions on the transducer like:

- Digital filter
- Operation: Standard / Peak
- Zero

The transmitter is supplied with a standard connector RS-232 DE-9 to connect the load cell and a USB port type B to connect the customer's PC.

On request ia availlable a software for the connection to a PC up to 4 transmitters and load cells in the same time.

TECHNICAL FEATURES		
Code		HU AMP PC
Measurement channels		Force / Time
Accuracy		≤ ± 0,02 %
Linear error		≤ ± 0,02 %
Power supply		Self powered from USB
Nominal feeling		2 mV/V
Connectable load cells		4 (350Ω) - 8 (700Ω)
Load cell feeding		3 Vdc ±4%
Connection type		4 wire
Input interface		RS-232 DE-9
Output interface		USB 2.0 type B
Transmission speed (BaudRate=38400)		Max. 250 (filter 0)
Resolution (2 mV/V)		± 20000 division
Reading per second		125 (3000 in peak mode)
Max. cable length (from transmitter to PC)		10 m
Working temperature		0°C ÷ +50°C
Temperature variation effect (10°C)	**On zero**	≤ ± 0,01 %
	On full scale	≤ ± 0,01 %
Zero function		100 %
Programmable digital filter		from 0 to 99
Peak function		Positive and negative
Protection class (IEC 60529)		IP20
Materials		ABS
Dimensions		20x90x40
Weight		~ 0,1 kg

POSITION TRASDUCERS

HU SAP ... / HU SIP ...

Position trasducers ANALOG and IO-LINK

The transducers **HU SAP** (analog) and **HU SIP** (IO-link) continuously detect the piston position inside the pneumo-hydraulic power unit using a direct, non-contact method.

The transducers of the series, available for different measuring ranges, are specially developed for the power units and they guarantee a high resolution precise position detection.

They can be mounted directly in T-groves without the need of additional accessories; this makes their assembly extremely easy.

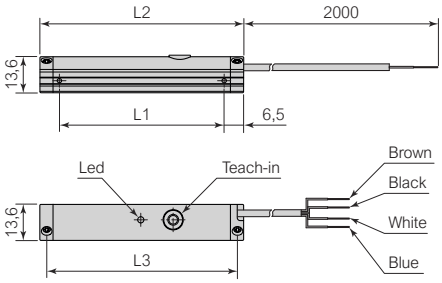
The positioning data, transmitted through the analog or O-Link outputs, allows to organize the adjustments of the production process in a significantly flexible way.

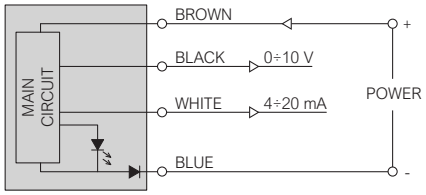
The TEACH-IN or O-LINK button allows to adapt the transducer settings during installation and later, depending on the variant, such as:

- Adapting the measuring range;
- Inverting the analog signal;
- Setting switching points;
- Inverting switching functions.

HU SAP ...

Position trasducers ANALOG with TEACH-IN





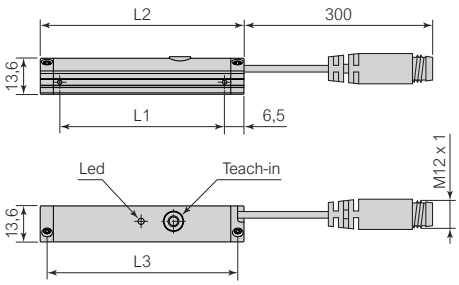
Technical features

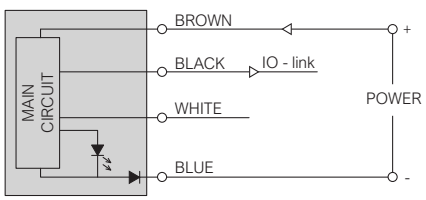
Code	HU SAP 032	HU SAP 064	HU SAP 128	HU SAP 192	HU SAP 224
Version	Analog with Teach-in - Cable 4 x 0,08 mm²				
Measuring range (L1)	32 mm	64 mm	128 mm	192 mm	224 mm
Total length (L2)	45 mm	77 mm	141 mm	205 mm	237 mm
Distance of fixing screws (L3)	40 mm	72 mm	136 mm	200 mm	232 mm
Output function	Analog				
Output voltage	0 ÷ 10 Vdc				
Output current	4 ÷ 20 mA				
Supply voltage	15 ÷ 30 Vdc				
Power consumption	≤ 22 mA				
Load resistance	min. ≥ 2 kΩ - max. ≤ 500 Ω				
Resolution	0,03 % F.S.				
Linearity error	0,3 mm				
Repeat accuracy	0,06 % F.S.				
Sampling rate	1 ms				
Visual indicator	LED yellow diode				
Protection class	III				
Working temperature	-20°C ÷ +70°C				
Protection class (IEC 60529)	IP67				
Protection circuit	Short-circuit, power source reverse polarity, power-up pulse				
Mounting	Screw for "T" groove - Torque max. 0,3 Nm				

HU SAP ... / Sensor in ENGINEERING POLYMER, cable PUR - 1 piece each package

HU SIP ...

Position trasducers IO-LINK with TEACH-IN





Technical features

Code	HU SIP 032	HU SIP 064	HU SIP 128	HU SIP 192	HU SIP 224
Version	IO-LINK with Teach-in - Cable 4 x 0,08 mm²				
Measuring range (L1)	32 mm	64 mm	128 mm	192 mm	224 mm
Total length (L2)	45 mm	77 mm	141 mm	205 mm	237 mm
Distance of fixing screws (L3)	40 mm	72 mm	136 mm	200 mm	232 mm
Output function	IO - LINK				
Output voltage	-				
Output current	-				
Supply voltage	15 ÷ 30 Vdc				
Power consumption	≤ 25 mA				
Load resistance	min. ≥ 2 kΩ - max. ≤ 500 Ω				
Resolution	0,03 % F.S.				
Linearity error	0,3 mm				
Repeat accuracy	0,06 % F.S.				
Sampling rate	1 ms				
Visual indicator	LED yellow diode				
Protection class	III				
Working temperature	-20°C ÷ +70°C				
Protection class (IEC 60529)	IP67				
Protection circuit	Short-circuit, power source reverse polarity, power-up pulse				
Mounting	Screw for "T" groove - Torque max. 0,3 Nm				

HU SIP ... / Sensor in ENGINEERING POLYMER, cable PUR - 1 piece each package

PRESSURE TRASDUCERS

HU PT ...

Pressure trasducers ANALOG

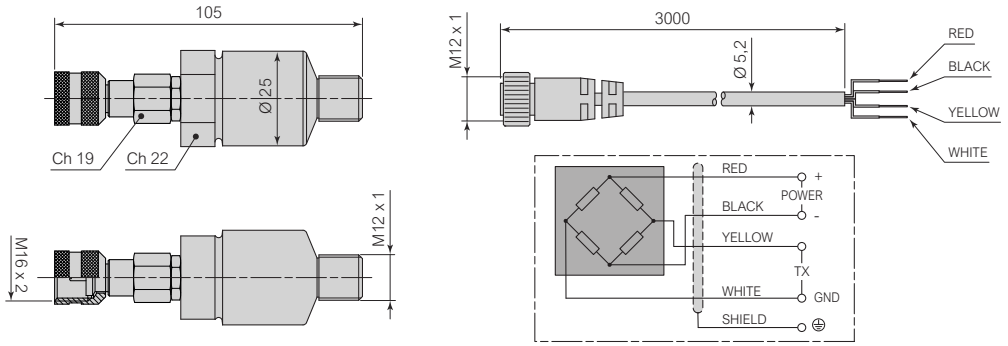
Pressure transducers **HU PT** series distinguish themselves for both high reliability and robustness.

It is supplied in non-amplified version with 2mV/V standard output (on request: availlable the amplified version with a 5V output) which makes the easier connection to a PLC or with the process controllers HU QPC MP and HU QPC MB series.

Process control can be performed with the pressure transducer in place of the cell load, considering that the pressure transducer does not measure the force developed by the unit during the approach phase.

The advantage of this shape is the elimination of the dimension of a possible load cell because the pressure transucer will be mounted in the threaded connection located on the head of the multiplication chamber.

TECHNICAL FEATURES

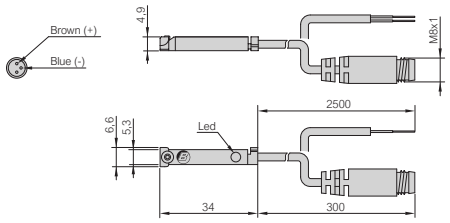


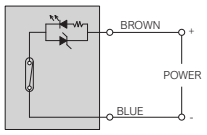
Code		HU PT 02	HU PT 05	HU PT 06
Absolute pressure		20 bar	250 bar	350 bar
Output function		Analog		
Linearity		≤ ± 0,50 %	≤ ± 0,20 %	≤ ± 0,20 %
Hysteresis		≤ ± 0,50 %	≤ ± 0,20 %	≤ ± 0,20 %
Temperature variation effect	**On zero**	≤ ± 0,020 %		
	On sensitivity	≤ ± 0,015 %		
Nominal sensitivity		2 mV/V ≤ ± 0,5 %		
Nominal power supply		1 ÷ 15 V		
Max. power supply		18 V		
Input resistance		580 Ω		
Output resistance		500 Ω		
Insulation resistance		> 2 GΩ		
Zero balance		≤ ± 0,5 %		
Response frequency		20 ÷ 100 kHz		
Limit mechanical values referred to nominal pressure	**Service pressure**	100 %		
	Max permissive pressure	150 %		
	Breaking pressure	> 300 %		
	Highly dynamic pressure	75 %		
Working temperature		-10°C ÷ +100°C		
Protection class (IEC 60529)		IP67		
Materials		Trasducer in stainless steel - M12 connector in steel - Shielded cable in PVC		

END OF STROKE SENSORS TYPE SR

SRC-61, SRC-21, SRC-27

End of stroke sensor REED - 2 poles N.O.



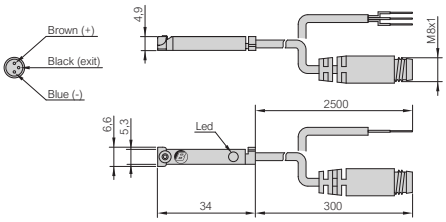


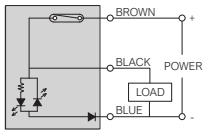
Technical features			
Code	SRC-61	SRC-21	SRC-27
Version	Cable 2 x 0,14 mm²	Cable 2 x 0,14 mm²	Connector M8 x 1 - 2 pin
Cable length	2500 mm	2500 mm	300 mm
Sensor	REED		
Output	Pure contact, normally open		
Operating voltage	5 ÷ 230 Vac / Vdc	5 ÷ 130 Vac / Vdc	5 ÷ 50 Vac / Vdc
Switching current (max.)	200 mA	200 mA	200 mA
Contact rating (max.)	10 W	6 W	6 W
Voltage drop (max.)	3 V	3 V	3 V
Visual indicator	LED yellow diode		
Operating frequency	1000 Hz		
Working temperature	-15°C ÷ +70°C		
Protection class (IEC 60529))	IP67		
Protection circuit	Power source reverse polarity		
Mounting	Screw for "T" groove - Torque max. 0,15 Nm		

SRC-61, SRC-21, SRC-27 / Sensor in PA6, cable in PUR - 1 piece each package

SRD-21, SRD-27

End of stroke sensor REED - 3 poles N.O.



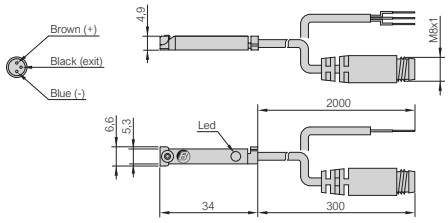


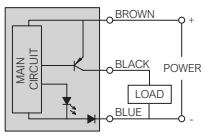
Technical features		
Code	SRD-21	SRD-27
Version	Cable 3 x 0,14 mm²	Connector M8 x 1 - 3 pin
Cable length	2500 mm	300 mm
Sensor	REED	
Output	PNP, normally open	
Operating voltage	5 ÷ 30 Vac / Vdc	
Switching current (max.)	200 mA	
Contact rating (max.)	6 W	
Voltage drop (max.)	0,7 V	
Visual indicator	LED yellow diode	
Operating frequency	1000 Hz	
Working temperature	-15°C ÷ +70°C	
Protection class (IEC 60529))	IP67	
Protection circuit	Power source reverse polarity	
Mounting	Screw for "T" groove - Torque max. 0,15 Nm	

SRD-21, SRD-27 / Sensor in PA6, cable in PUR - 1 piece each package

SRN-21, SRN-27

End of stroke sensor HALL PNP - 3 poles N.O.



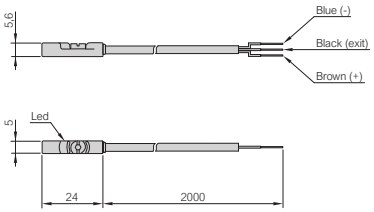


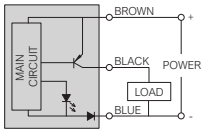
Technical features		
Code	SRN-21	SRN-27
Version	Cable 3 x 0,14 mm²	Connector M8 x 1 - 3 pin
Cable length	2000 mm	300 mm
Sensor	HALL	
Output	PNP, normally open	
Operating voltage	10 ÷ 30 Vdc	
Switching current (max.)	200 mA	
Contact rating (max.)	4 W	
Voltage drop (max.)	0,7 V	
Visual indicator	LED yellow diode	
Operating frequency	1000 Hz	
Working temperature	-15°C ÷ +70°C	
Protection class (IEC 60529))	IP67	
Protection circuit	Power source reverse polarity	
Mounting	Screw for "T" groove - Torque max. 0,15 Nm	

SRN-21, SRN-27 / Sensor in PA6, cable in PUR - 1 piece each package

END OF STROKE SENSORS TYPE SK9 with enclosure classification IP69K

SK9-21
End of stroke sensor HALL PNP - 3 poles N.O.



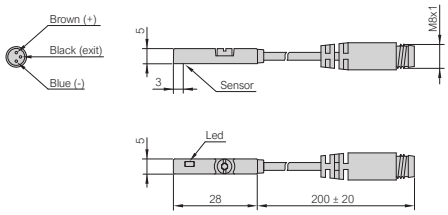


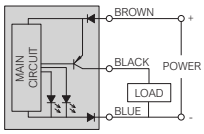
Technical features	
Code	SK9-21
Version	Cable 3 x 0,14 mm²
Cable length	2000 mm
Sensor	HALL
Output	PNP, normally open
Operating voltage	10 ÷ 30 Vdc
Switching current (max.)	200 mA
Contact rating (max.)	6 W
Current consumption	10 mA (without load)
Voltage drop (max.)	2,2 V
Visual indicator	LED yellow diode: flashing (instable position) permanently light (stable position)
Operating frequency	1000 Hz
Working temperature	-30°C ÷ +80°C
Protection class (DIN 40050)	IP69K
Protection circuit	Short-circuit, power source reverse polarity, power-up pulse
Mounting	Screw for "T" groove - Torque max. 0,3 Nm

SK9-21 / Sensor in PA12, cable in PUR - 1 piece each package

END OF STROKE SENSORS TYPE SKC with precise positioning sistem

SKC-27
End of stroke sensor HALL PNP - 3 poles N.O.



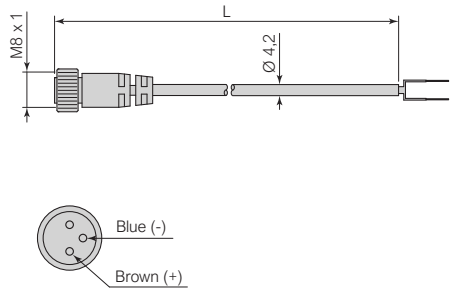


Technical features	
Code	SKC-27
Version	Connector M8 x 1 - 3 pin
Cable length	200 mm
Sensor	HALL
Output	PNP, normally open
Operating voltage	10 ÷ 28 Vdc
Switching current (max.)	80 mA
Contact rating (max.)	2 W
Current consumption	10 mA (24 Vdc)
Voltage drop (max.)	1,5 V
Leakage current (max.)	0,05 mA
Visual indicator	Two colors LED diode: red (instable position) green (stable position)
Operating frequency	1000 Hz
Working temperature	-10°C ÷ +60°C
Protection class (IEC 60529)	IP67
Protection circuit	Short-circuit, power source reverse polarity, power-up pulse
Mounting	Screw for "T" groove - Torque max. 0,3 Nm

SKC-27 / Sensor in PA, cable in PUR - 1 piece each package

THREADED CONNECTORS TYPE Y082LC SUITABLE FOR SRC-27

Y082LC ...
Threaded connectors - 2 poles

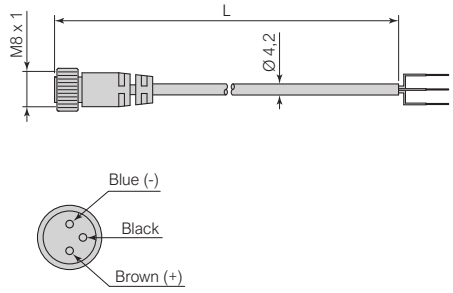


Technical features		
Code	Y082LC250C	Y082LC500C
Threaded connector	M8 x 1	
End connector	Open	
Cable	2 x 0,14 mm²	
Cable length (L)	2500 mm	5000 mm
Operating voltage (max.)	50 Vac / 60 Vdc	
Current (max.)	3000 mA	
Working temperature	-25°C ÷ +75°C	
Protection class (IEC 60529)	IP67	

Y082LC ... / Connector in PVC, contacts in gilded brass, cable in PVC - 1 piece each package

THREADED CONNECTORS TYPE Y083LC SUITABLE FOR SRD-27, SRN-27, SKC-27

Y083LC ...
Threaded connectors - 3 poles

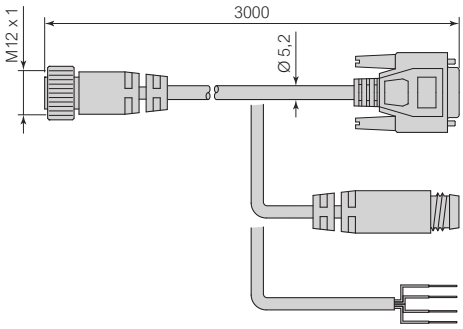


Technical features		
Code	Y083LC250D	Y083LC500D
Threaded connector	M8 x 1	
End connector	Open	
Cable	3 x 0,14 mm²	
Cable length (L)	2500 mm	5000 mm
Operating voltage (max.)	50 Vac / 60 Vdc	
Current (max.)	3000 mA	
Working temperature	-25°C ÷ +75°C	
Protection class (IEC 60529)	IP67	

Y083LC ... / Connector in PVC, contacts in gilded brass, cable in PVC - 1 piece each package

CONNETTORI FILETTATI TIPO Y124LC

Y124LC ...
Threaded connectors - 4 poles



Technical features	
Code	See table
Threaded connector	M12 x 1
End connector	RS-232 DE9 / 4 poles connector / Open
Cable	4 x 0.35 mm²
Cable length (L)	3000 mm
Operating voltage (max.)	250 V
Current (max.)	4000 mA
Working temperature	-10°C ÷ +70°C
Protection class (IEC 60529)	IP67

Y124LC ... / Connector M12 in steel / PVC, cable in PVC - 1 piece each package

	ACCESSORIES			
PROCESS CONTROL	**HU CC. ST**	**HU SAP ...**	**HU SIP ...**	**HU PT ...**
HU QPC MP	Y124LC3MPRST	Y124LC3MPRSA	Y124LC3MPRSI	Y124LC3MPRPT
HU QPC MB	Y124LC3MBRST	on request	on request	Y124LC3MBRPT
HU VF	Y124LC3VFRST	n.a.	n.a.	Y124LC3VFRPT
HU AMP PC	Y124LC3PCRST	n.a.	n.a.	Y124LC3PCRPT
AT CUSTOMER CARE (open end)	Y124LC300D	n.a.	Y124LC300D	Y124LC300D

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is a trademark of BONESI PNEUMATIK

www.kratospack.it
info@bonesipneumatik.it
Phone +39 0331 448000 (r.a.)

Via A. Robino n. 117
20025 Legnano (MI) Italy
P.I. / C.F. 10396340159
R.E.A. 1373315