

TOTAL TEST

CYLINDERS RE FLUSHING TESTING



POWER & CONTROL BY



ACCURACY IN CYLINDER MOUNTING FLUSHING AND TESTING - 2018 PRODUCTION

INDUSTRIA 4.0 MEMBER



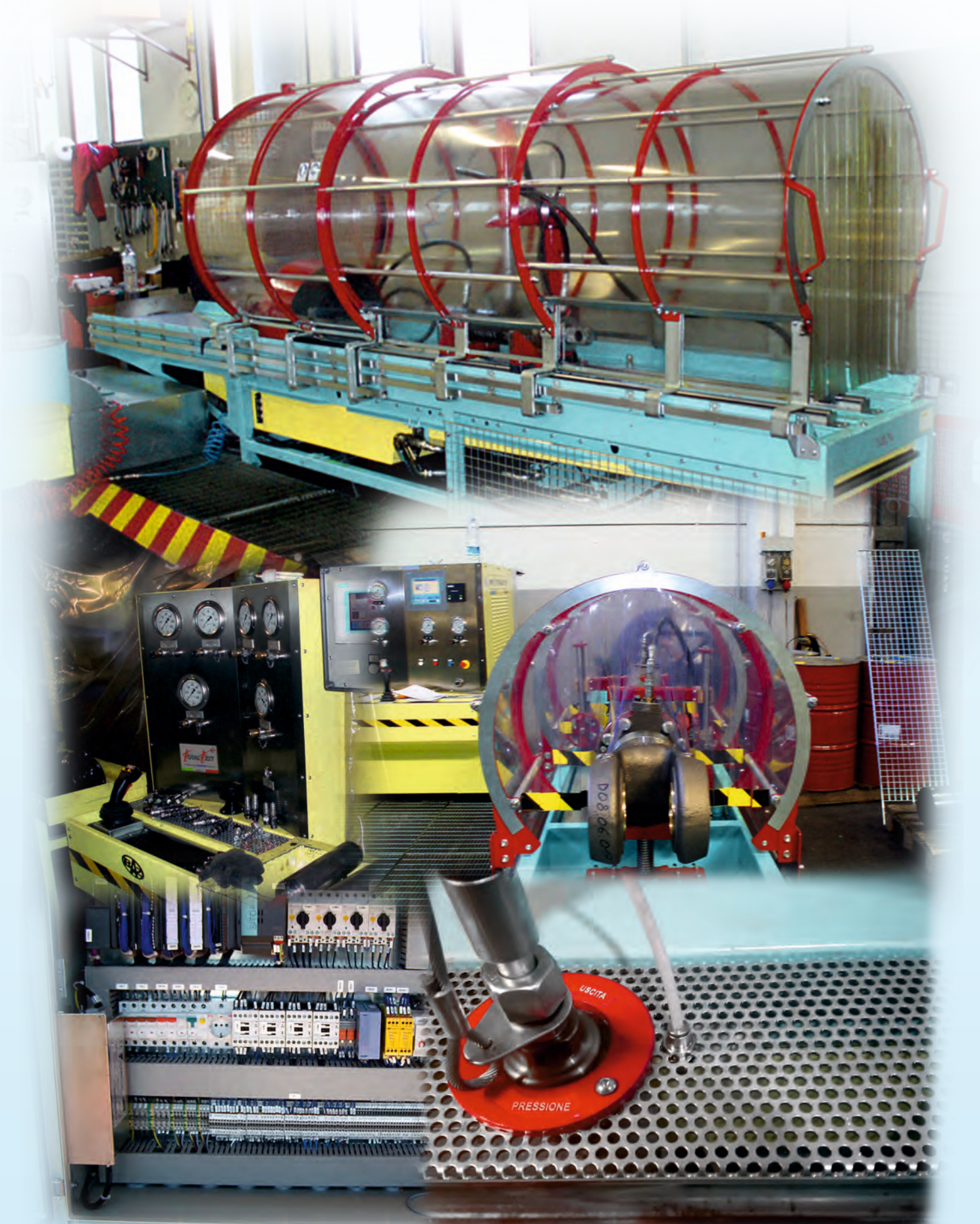
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TTDOC00051 REV 2 04/07/17

PAG. 1

PROVE





**MACHINES FOR CYLINDERS
INDUSTRIAL PLANT SYSTEM
2018 PRODUCTION**



CE

ISO 10100.2001 (EX ISO 10100.2005) e oltre
ISO 4406



CE

**ISO 10100.2001 (EX ISO 10100.2005) e oltre
ISO 4406**



DJE BEL
hydraulic cylinders



FAROIL
hydraulic cylinders



IDROMECC



Noufar
SENSOR & HYDRAULIC CYLINDERS



OCIMA



**OFFICINA MECCANICA
MICHINELLI S.R.L.**



VENIERI



SIGNORI & FIGLIO



soilmec
Drilling and Foundation Equipment



U.S. ARMY



V.G. S.R.L.

CE

Testing and flushing machines
for hydraulic cylinder **MPC** family

New generation machines for testing and flushing of hydraulic cylinders according to CE safety rules. The machines are the result of intensive research and development work and can operate manually or automatically.

Software



- The machine software can be PLC based Siemens with touch screen and report printer, it may alternatively consist in PC based system to be interfaced with the company network;
- Optional bar code recording and management;
- Customized software available on request;
- Machine pressure drop reset to state lone cylinder data;
- Possible web monitoring, update and trouble shooting.

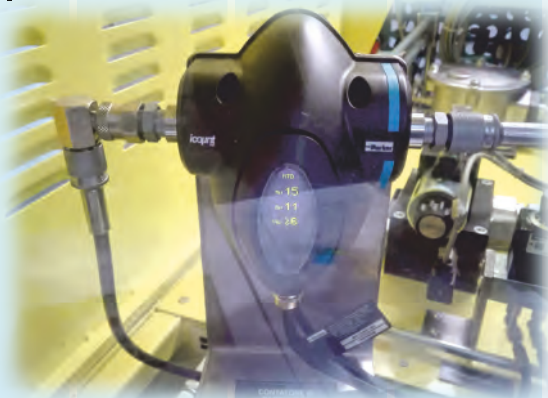
Testing:

- Cylinder test procedure based on **ISO 10100:2001** standard. by comparison of measured pressure loss inside the cylinder chambers with a validated sample stored in the test program taking into account parameters, time and other company data;
- The machine do perform the test at a controlled and stabilized fluid temperature between 38°C and 42°C.

The system goes over the standard by performing following tests:

- Sliding pressure monitoring during the full stroke of the cylinder; unexpected pressure deviations put in evidence by pressure Vs. time graph.
- Sealing test performed in any intermediate position of the piston (non only at stroke ends).
- Braking chamber pressure monitoring (with optional graph and statistics).
- Control valves integrated into the cylinder.
- Stroke and position measure (by instrument up to mm cent precision).
- Possibility of tests under load.

Flushing:



- The machine is equipped with a well sized filtration system that works on the oil pressure and return lines; a special controlled (Patented) off-line filtration system is also provided in order to further clean the fluid and to ensure the desired fluid contamination level;
- The operator can input the max allowed contamination in the test program; a laser scan particle counter is placed in line with the circuit and it is used to control the oil contamination level;
- The system can manage different contamination level per **ISO 4406**, **NAS** or **GHOST** standards.

FLUSHING SET

How the **MPC** testing and flushing machines monitor and control the oil cleanliness conditions

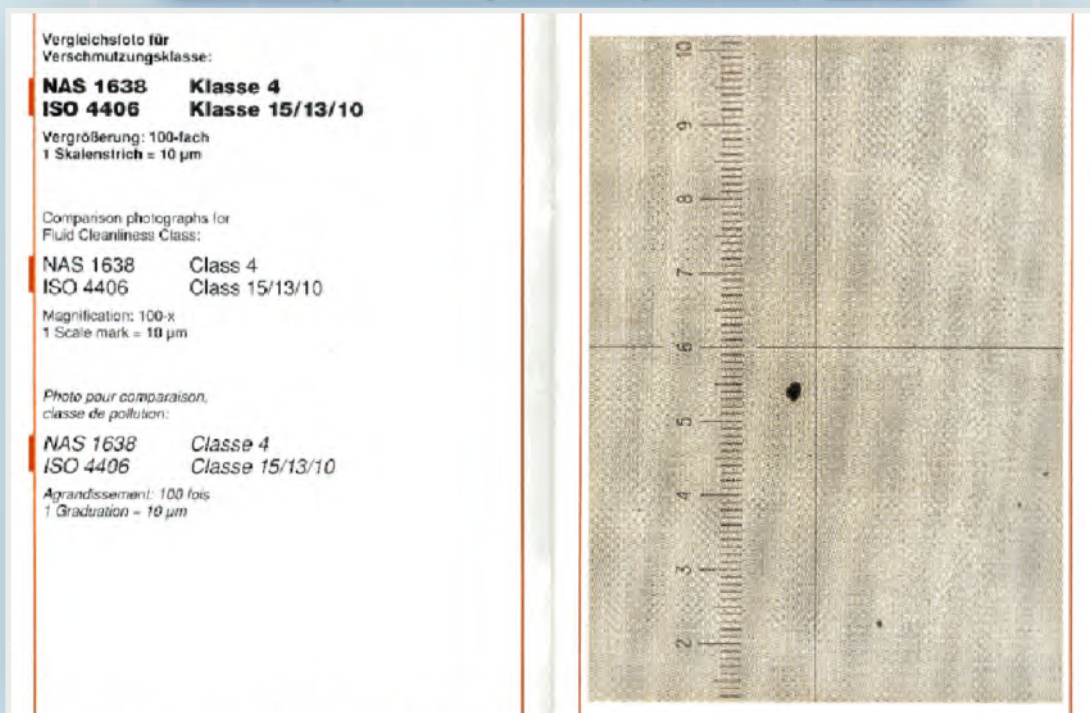
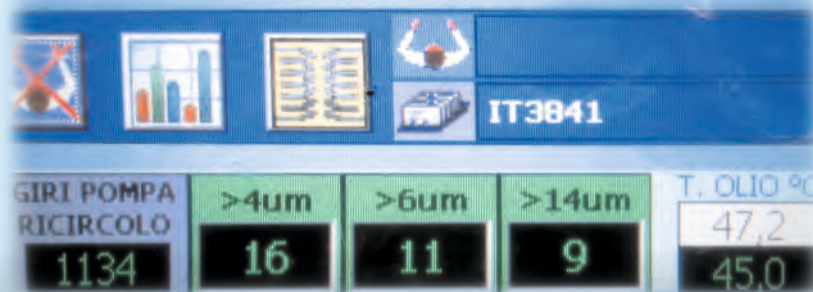
The controlled contamination level is the one of the oil inside machine tank. The **MPC** machine is set to operate in accordance with **ISO 4406** standard but may alternatively be set to **NAS** or **GHOST** standards by internal conversion system. The machine is predisposed to evidence best achieved contamination values.

Machine tank fill up from oil drums is made by mean of the off line pump and filters. Tank venting is fitted with 10 μ filters. The pressure and return line to and from the cylinder are also equipped with 10 μ filters to protect the valves. The off line system is further equipped with a dialysis membrane system operating under a (Patented) PLC based control method.

The actual class of contamination is constantly measured by a laser scan particle counter, visualised on the screen and printed on the test report. Filter clogging condition is also constantly checked and reported by machine PLC.

TOTALTEST can also provide a (patented) optional sampling system based on filtering membranes (Millipore system) directly connected to the A and B cylinder chambers allowing the check of the contamination inside the cylinder during first fill up and washing phases.

The cylinder contamination from A and B ports can also be checked electronically. This optional system do however require constant fluid flows of at least 5 seconds not always compatible with cylinder size.



Safety:

- All machines do comply with the applicable CE safety regulations;
- Machine frame is fully closed and designed to reduce the noise level and to prevent risks of fluid splash. The cylinder holding unit is equipped with transparent and interlocked protective devices of sliding type;
- The flexible hoses are secured against whiplash by special steel bonds and run under a protection grid below the cylinder;
- Gratings or platforms may be supplied on request for operator safety;

In order to ensure the best operator safety during all the testing operations, **TOTALTEST** have developed a wide range of protection system for the cylinder support device; this in order to reduce specific risk level and to fulfill customer needs and local safety requirements:

• telescopic protection barrier

Do protect the operator against cylinder blow, pipe blow or whiplash along full rod stroke.



• single tunnel barrier

Single piece sliding tunnel in way of cylinder and ports area segregating cylinder operation inside a protective barrier.



• double tunnel barrier

Improved safety system against cylinder end cup blow with double movable section. Available cylinder fitting space limited to 3.500 mm.



INSTALLATION LAYOUT

The allocation and the design of the workshop area dedicated to cylinder testing is important to ease operations and safety. It is recommended to install the cylinder testing machine in a “white area” served by lifting devices and accessible by transport equipment. #TOTAL#EST can recommend on request best test area layout.



AIR/OIL separation technology.

In addition to mentioned oil condition and contamination monitoring, the **MPC** machine is equipped with a special technology for air-oil separation.

#TOTAL#EST consequently developed a special mechanical plus software controlled separation system against oil contamination by air inside machine and tank which do collect the separated air to the atmosphere.



The test report do state all test phases and results together with other Company data and may be customised;



The #TOTAL#EST software do allow the generation of reports in PDF format and customized paper forms. The report can include graphs and statistical data and can be easily filed.

Faroil S.r.l.
Codice: R20120329
Qta. N° 0001 Di N° 0002
Operatore: Admin
Pres.Es. BAR 0200
Temp. Olio °C 050.3
Cnt. Olio ISO 18/16/13
Misura stelo mm 0505.0
"Camera A"
Pres. Max. BAR 0200
Delta P TEST OK
Durata (m:s) 00:10
Scorrimento BAR 003.0
"Camera B"
Pres. Max. BAR 0202
Delta P TEST OK
Durata (m:s) 00:10
Scorrimento BAR 002.7
Prova intermedia ok
Prova positiva
Cicli alta pressione N°001
T.TOTAL (h:m:s) 00:02:12
DATA-ORA 02/07/12 13:47

INTERPUMP HYDRAULICS INTERNATIONAL

CONTARINI

Certificato di collaudo funzionale.

Testing report

Comessa: CO 1301007 <small>Work order n°:</small>	Quantità N°: 0005 <small>Total quantity:</small>
Codice Disegno: XE442001040HM20 <small>Drawing number:</small>	di N°: 0005 <small>Number of tested cylinders:</small>
Pres. Es. (Bar): 0200 <small>Working pressure:</small>	Cnt. Olio ISO: 26/25/19 <small>Oil impurities:</small>
Temp. Olio °C: 043,6 <small>Oil temperature:</small>	Misura stelo (mm): <small>Stroke:</small>
Operatore: Mario Rossi <small>Machine operator:</small>	

"Camera A" Annulus side of the cylinder	"Camera B" Full bore side of the cylinder
Pres. Max. (Bar): 0200 <small>Maximum pressure:</small>	Pres. Max. (Bar): 0200 <small>Maximum pressure:</small>
Delta P: TEST OK <small>Pressure range:</small>	Delta P: TEST OK <small>Pressure range:</small>
Durata (ms): 00:20 <small>Time test (min/sec):</small>	Durata (ms): 00:20 <small>Time test (min/sec):</small>
Scorrimento (Bar): <small>Break of pressure:</small>	Scorrimento (Bar): <small>Break of pressure:</small>

Esito collaudo: PROVA POSITIVA <small>Test result report:</small>	Data/Ora: 18/03/2013 - 15:36 <small>Date/Time:</small>
Cicli alta pressione N°: 001 <small>Number of cycles with high pressure:</small>	Tempo totale (h:m:s): 00:06:54 <small>Time test:</small>

Riepilogo Final results

Comessa: CO 1301007 <small>Work order n°:</small>	Quantità pezzi N°: 0005 <small>Total quantity:</small>
Codice Disegno: XE442001040HM20 <small>Drawing number:</small>	Operatore: Mario Rossi <small>Machine operator:</small>
Cilindri conformi: 0005 <small>Conformity:</small>	Cilindri non conformi: 0000 <small>Not conformity:</small>

Note:

Documenti allegati:

Responsabile del Sistema di Gestione della Qualità:

Si conferma che la Contarini Leopoldo S.r.l. ha costruito il cilindro seguendo scrupolosamente le richieste specifiche del cliente riportate nel disegno costruttivo consegnato dal cliente e dalla firma del cliente e che il controllo dimensionale ed il collaudo funzionale hanno dato esito positivo. The company Contarini Leopoldo S.r.l. confirms that the cylinders have been executed strictly following the customer specifications, indicated on the constructive drawing signed and stamped for approval by the Customer, and that the dimensional and the hydraulic inspection gave a positive outcome.

Contarini Leopoldo S.r.l. a socio unico
 Sede Legale: via A. Volta, 34 • 48022 Lago RA - Italy • Tel. +39 0595 261111 • P. IVA 03000001030
 Cap. Soc. Euro 66.800,00 i.r. • D.P. - Marche - Reg. Imprese RA 00096710297 • P. IVA 03000001030
 Società ad attività di Direzione e Coordinamento da autor. Interpump S.p.A.

CONTARINI LEOPOLDO S.r.l.
 Società a partecipazione
 Via A. Volta, 34 • 48022 Lago RA - Italy
 Tel. +39 0595 261111 • P. IVA 03000001030
 C.S. Euro 66.800,00 i.r. • D.P. - Marche - Reg. Imprese RA 00096710297
 Reg. Imp. e Persone Fis. e P. IVA n. 03000001030

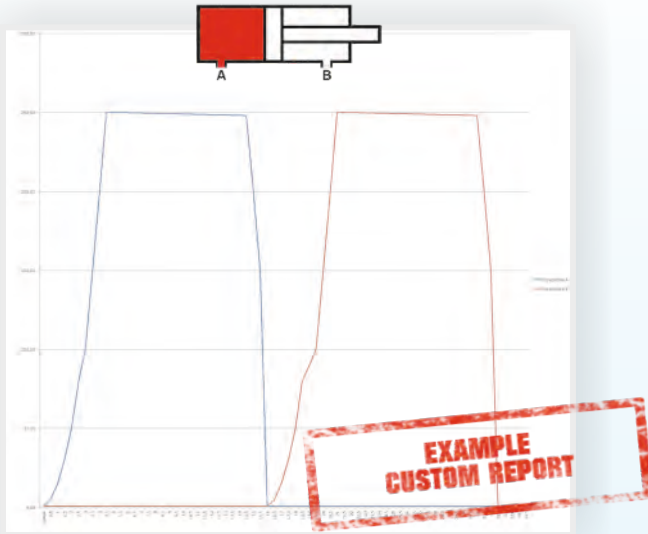
CERMET
SISTEMI
ELETTRICI
ELETTRONICI
ELETTRICI
ELETTRONICI

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EXAMPLE CUSTOM REPORT

EXAMPLE STANDARD REPORT

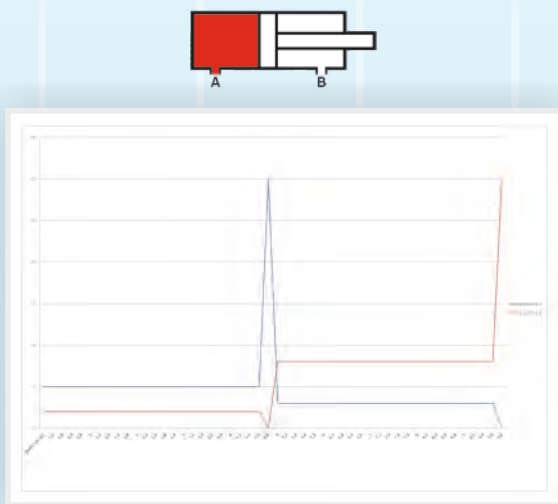




OPERAZIONE		RISULTI	
totaltest			
CODICE CILINDRO			
OCCHIA test 2			
NUMERO CILINDRO			
19032015			
TEMPERATURA OLIO			
45			
CLASSE DI CONTAMINAZIONE			
ISO	11	B	0
PROVA CON OLA CAMERA A			
PRESSIONE MAX		6,1	
Tempo di collaudo		10	
Delta Pressurizzato		-0,3	
ESITO			
POSITIVO			
Parametri di accensione:			
Camera A	2		
Camera B	8		
COLLAUDO CAMERA B			
PRESSIONE MAX		276	
Tempo di collaudo		15	
Delta Pressurizzato		4,3	
ESITO			
INCERTA			
PROVA RETTORIBILA			
PRESSIONE MAX		276	
Tempo di collaudo		15	
Delta Pressurizzato		2,6	
ESITO			
INCERTA			
COLLAUDO CAMERA A			
PRESSIONE MAX		277	
Tempo di collaudo		15	
Delta Pressurizzato		2,6	
ESITO			
INCERTA			
DATA DI COLLAUDO			
20/03/2015			
ORA INIZIO			
17.53.10			
ORA FINE			
17.59.34			
ESITO			
NEGATIVA			

Seal and leakage test.

Seals and cylinder structure are tested by carrying out a test at predefined static pressure with sealed ports. As cylinder structure and hydraulic oil are basically not compressible, any leakage do cause a pressure drop. The pressure drop measured by the machine during the preset test time do define the result of the test. Possible problems conditioning cylinder test are seal settlement, full cylinder fill up, test time and oil temperature inside the cylinder (also depending on ambient conditions) and consequent cylinder frame temperature. To avoid the above, the machine carries out several preliminary working runs to correctly fill up and pressurize cylinder chambers, set cylinder seals and carry the cylinder frame to best temperature for the test. Due to possible variables to be taken into consideration like oil cooling during test time, it is necessary to carry out some preliminary test of the involved cylinder type, extended if possible to more units, to define the correct test data.



Graph showing oil pressure monitoring during rod stroke at pre set flow rate and speed.



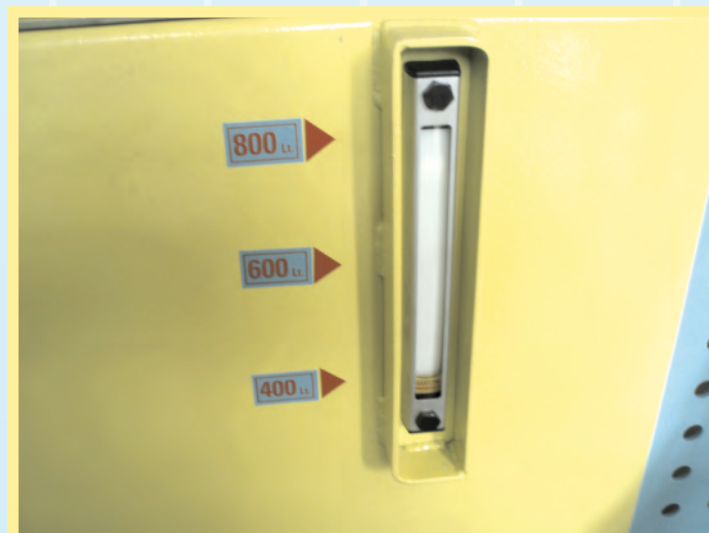
Graph showing sliding pressure Vs. time and position during cylinder full stroke, showing unexpected shifting problems and relevant position.



CYLINDERS VOLUME TABLE

		CORSA												
		50	100	200	500	1000	2000	3000	4000	5000	6000	7000	8000	
ALESAGGIO	40	0,06	0,13	0,25	0,63	1,26	2,5	3,8	5,0	6,3	7,5	8,8	10	MPC1
	50	0,10	0,20	0,39	0,98	2,0	3,9	5,9	7,9	10	12	14	16	
	60	0,14	0,28	0,57	1,41	2,8	5,7	8,5	11	14	17	20	23	
	70	0,19	0,38	0,77	1,9	3,8	7,7	12	15	19	23	27	31	
	80	0,25	0,50	1,00	2,5	5,0	10	15	20	25	30	35	40	
	90	0,32	0,64	1,27	3,2	6,4	13	19	25	32	38	45	51	
	100	0,39	0,79	1,6	3,9	7,9	16	24	31	39	47	55	63	
	110	0,47	0,95	1,9	4,7	9,5	19	28	38	47	57	66	76	
	120	0,57	1,13	2,3	5,7	11	23	34	45	57	68	79	90	
	130	0,66	1,33	2,7	6,6	13	27	40	53	66	80	93	106	
	140	0,77	1,5	3,1	7,7	15	31	46	62	77	92	108	123	
	150	0,88	1,8	3,5	8,8	18	35	53	71	88	106	124	141	
	160	1,00	2,0	4,0	10	20	40	60	80	100	121	141	161	
	170	1,13	2,3	4,5	11	23	45	68	91	113	136	159	181	
	180	1,27	2,5	5,1	13	25	51	76	102	127	153	178	203	
	190	1,42	2,8	5,7	14	28	57	85	113	142	170	198	227	
	200	1,6	3,1	6,3	16	31	63	94	126	157	188	220	251	
	250	2,5	4,9	10	25	49	98	147	196	245	294	343	393	
	300	3,5	7,1	14	35	71	141	212	283	353	424	495	565	
	350	4,8	10	19	48	96	192	288	385	481	577	673	769	
400	6,3	13	25	63	126	251	377	502	628	754	879	1005		
500	10	20	39	98	196	393	589	785	981	1178	1374	1570		
600	14	28	57	141	283	565	848	1130	1413	1696	1978	2261		
700	19	38	77	192	385	769	1154	1539	1923	2308	2693	3077		
800	25	50	100	251	502	1005	1507	2010	2512	3014	3517	4019		
900	32	64	127	318	636	1272	1908	2543	3179	3815	4451	5087		
1000	39	79	157	393	785	1570	2355	3140	3925	4710	5495	6280		
													MPC2/MPC2,5	
													MPC3	
													MPC4	

Table stating the theoretical volume of chamber A of the involved cylinder based on relevant main size. Table ment to check (help checking) necessary oil tank volume to be never less than 30% of the total.



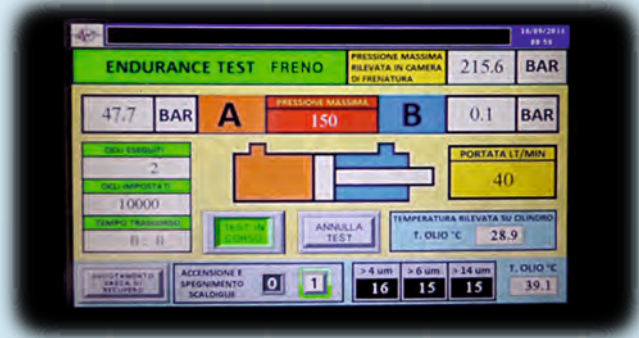
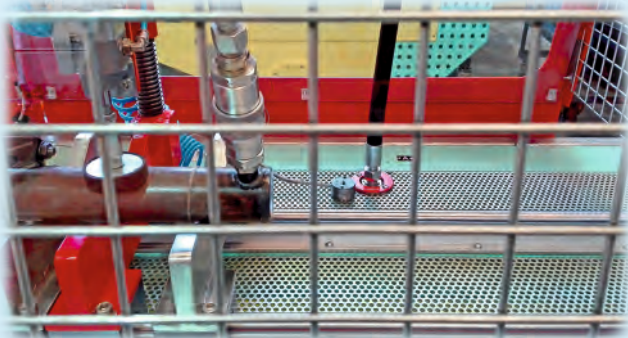
Testing and Endurance machine MPC0.3



- 320 bar piston pump;
- From 20 to 50 lt/min;
- 250 lt tank capacity;
- Mechanical security for uncontrolled cyclics.



FULL DATA SHEET ON REQUEST



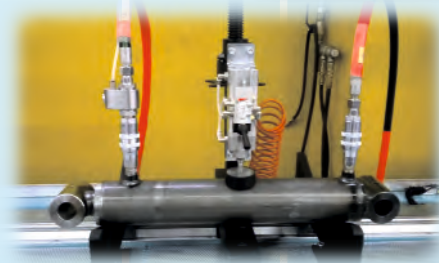
Testing machine MPC 0.5



- 20 lt/min low pressure pump;
- 420 bar high pressure pump;
- 250 lt tank capacity;
- Max testing pressure: 420 bar.



FULL DATA SHEET ON REQUEST



Testing and flushing machine **MPC1**



manual and automatic cycle

- 24 lt/min vane pump for low/mid pressure, plus very high pressure (up to 700 bar) piston pump;
- 200 lt standard tank capacity; possible increase to 400 lt by additional tank;
- Max testing pressure: 450 bar.

Single support tunnel TTYSCC000010, pag. 30.



FULL DATA SHEET ON REQUEST

The image show a test transfer setup whit air for microleakages search, oil test on five cylinder in movementt progression.

Testing and flushing machine **MPC 1.5**



manual and automatic cycle

- 20 cm³ piston pump for low/high pressure, plus very high pressure (up to 700 bar) piston pump;
- 300 lt standard tank capacity; possible increase to 800 lt by additional tank;
- Max testing pressure: 600 bar.



FULL DATA SHEET ON REQUEST

The photo illustrates a vertical support for testing ISO cylinders. Air and oil separation is done directly on ports, optional solution for small to medium sized cylinders.

Testing and flushing machine **MPC2**



manual and automatic cycle

- 20 cm³ piston pump for low/high pressure, plus very high pressure (up to 700 bar) piston pump;
- 400 lt standard tank capacity, possible increase up to 800 lt by additional tank;
- Max testing pressure: 450 - 550 bar.

Single support tunnel TTYSCC000010, pag. 30.



FULL DATA SHEET ON REQUEST

MPC2/2 testing machine with 2 test stand:

- Possibility to have more organized testing stand.



Double support tunnel TTYSCC000020, pag. 30.

Testing and flushing machine **MPC2.5**



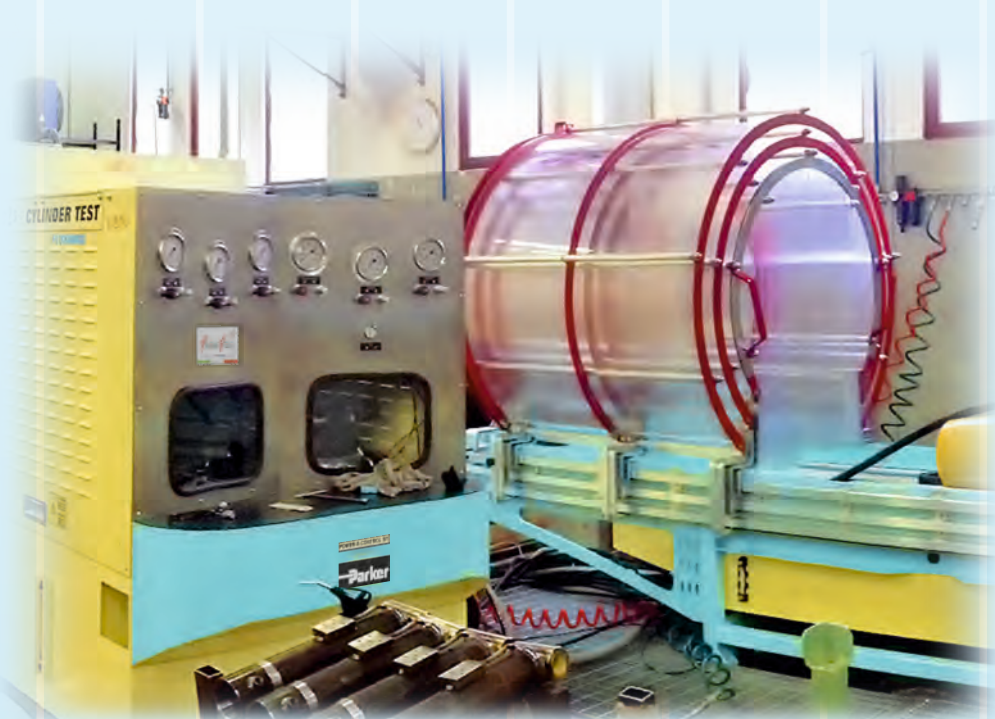
manual and automatic cycle

- 80 cm³ piston pump for low/high pressure, plus very high pressure (up to 700 bar) piston pump;
- 400 lt standard tank capacity, possible increase up to 800 lt by additional tank;
- Testing pressure: 550 - 600 bar.

Telescopic support TTYSCC000040, pag. 30.



FULL DATA SHEET ON REQUEST



Testing and flushing machine **MPC3**



manual and automatic cycle

- 80 cm³ piston pump for low/high pressure, plus very high pressure (up to 700 bar) piston pump;
- 600 lt standard tank capacity, possible increase up to 1.200 lt by additional tank;
- Max testing pressure: 600-700 bar.

Double tunnel support TTYSCC000040, pag. 30.



FULL DATA SHEET ON REQUEST



Testing and flushing machine **MPC4**



manual and automatic cycle

- Customized piston pump capacity for special needs, plus very high pressure (up to 700 bar) piston pump;
- Customized tank from 1'000 to 10'000 l ;
- Max testing pressure: 700 bar.

For testing of large size cylinders laying on ground or on the supports shown at page 30.

FULL DATA SHEET ON REQUEST



The Software of the MPC machines is user friendly and flexible and can be remotely controlled for update and support. Every machine is predisposed for the connection to additional tank. The tank of the **MPC** machine is outfitted with heating coils to allow tests with oil temperature above between 40 and 50 °C. The **TOTAL TEST** machine can also be equipped with a wide range of accessories.

Testing and flushing machine MPC



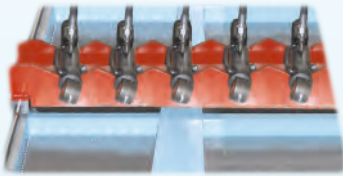
FIVE



*Simultaneously test of five cylinders whit distinc reports.
Change pallet machine.*

Some hydraulics/software solution of this machine are in patent pending. The machine presentation is directly at the potential interested customer.

TECHNICAL DETAILS



MPC



FIVE CYLINDERS TESTING

Features electrical system

Maximum Power	19.8 KW
Voltage	380 V Three-Phase
Frequency	50 Hz

Electric Engines

Motor for High Pressure System	Three-Phase Asynchronous 2.2 KW
Motor for Low Pressure System	Three-Phase Asynchronous 11 KW
Motor Pilot Plant	Three-Phase Asynchronous 2.2 KW
Motor for Recirculation System	Three-Phase Asynchronous 2.2 KW
Motor for Emptying MSC	Three-Phase Asynchronous 2.2 KW

Characteristics of Pneumatic System

Pression min/max	6/9 Bar
------------------	---------

Noisiness

Max Level of Sound Pressure	77 DB(A)
Distribution of the acoustic pressure at a distance of 1 meter from the machine.	

Hydraulic System

Tank capacity	From 800 lt up to 1600 lt with over tank
Fluids Allowed	Hydraulic oils according to DIN 51524 Reccomended viscosity grade: VG46
Maximum Temperature of the Fluid	60-65 °C
Low Pressure Circuit	Maximum Flow: according to Parker PV limits. Maximum Pressure: 315 Bar
High Pressure Circuit	Maximum Flow: 2.7 l/min Maximum Pressure: 600 Bar
Filtration Circuit	Maximum Flow: 54/108 l/min Maximum Pressure: 25 Bar Filter: $\beta_8 > 100$ Maximum reccomended level of oil contamination: 19/17/14 ISO 4406:1999
Cooling system whit refrigerant unit	Same data of Filtration Circuit: Maximum Temperature: 60-65°C Reccomended Temperature: 40-50°C

Compressed air pressure testing equipment **MPCA1**

for liquid immersion cylinder test



Test equipment to check possible cylinder liner, pipe and seal leakages by compressed air pressurization of the cylinder immersed in a test fluid. Possible leakages put in evidence by air bubbling.



Cylinder cleaning machine MPF2



Pressure washing machine to remove fabrication dross and calamine from liner and A + B tube internals by oil jetting up to 120 lt/min.



Three filtration level nets of removable type for cleaning.

Machines for validation



MPA 2

Test with water up to 40 bar.

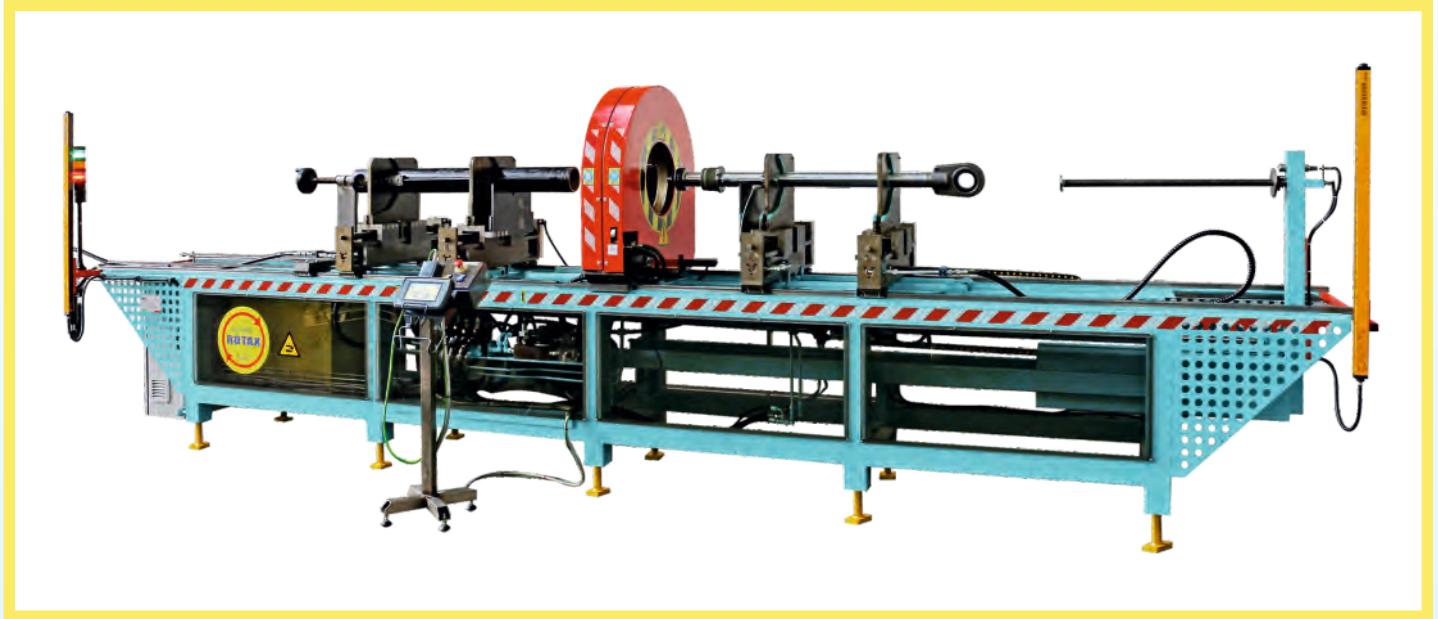


MPA 0,5

Test with oil up to 400 bar, with air up to 100 bar.



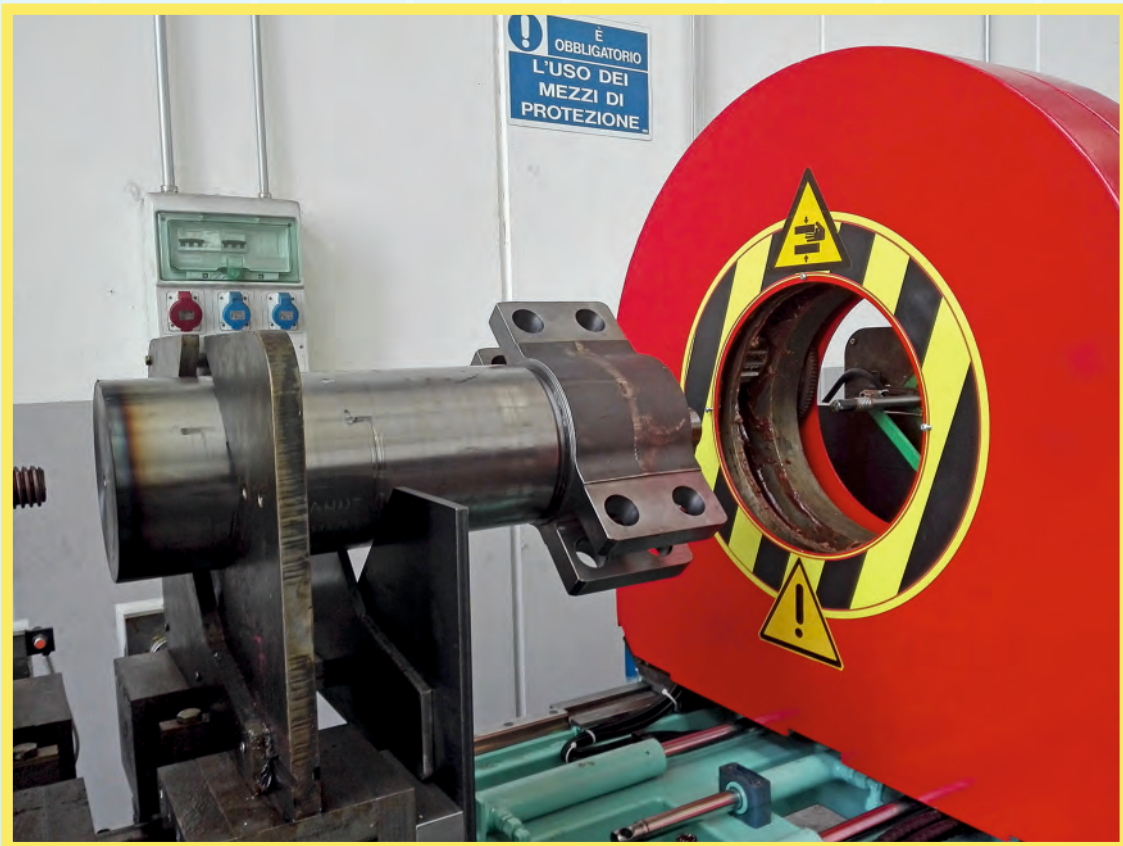
Automatic assembly and disassembly bench ROTAX



The machine has a digitized relationship between the manufacturer and the customer, between the operator and the one who manages it using the iper tax amortization. Issues a report second date, code, quantity or lot with the result of the tightening torque used during the cycle.

ROTAX video operation: <https://youtu.be/E4TviK-1Okk>

**Tightening torque 1.500 Nm.
The project includes tightening torque up to 1.200 Nm.**



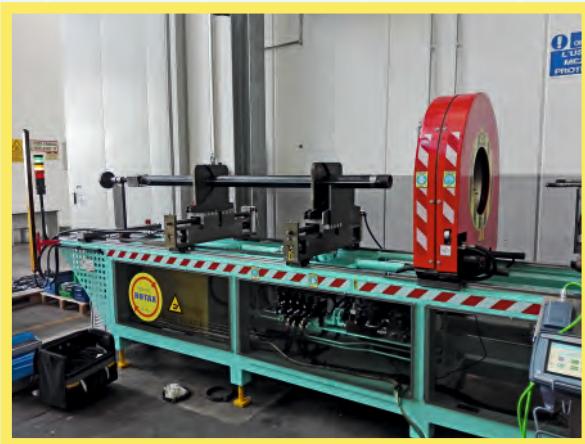
**Rotax work without tool change.
The cam lock ensures a grip on even out-sized objects.**

Absolutely versatile

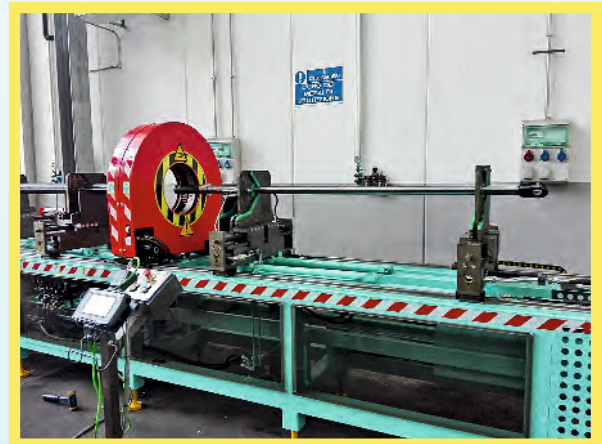


The projectual limit of manageable stroke is 4.000 mm.
The length of the machine varies according to customer needs.

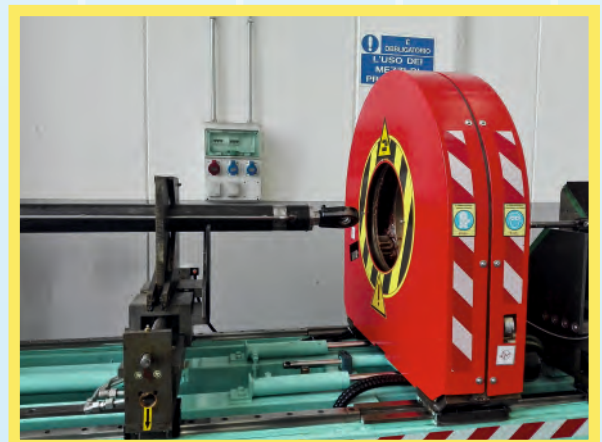
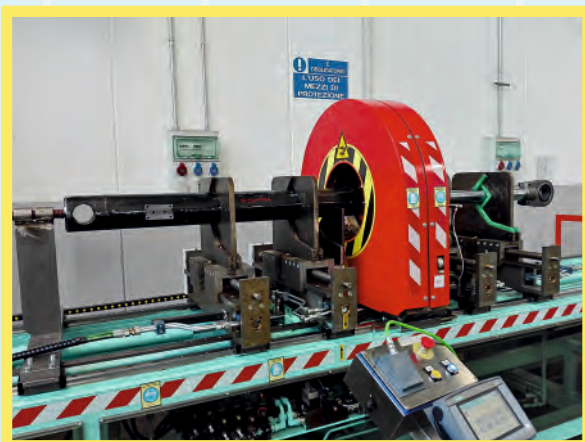
- Recipe management.
- Final report.
- Axial movement of the slewing 200 mm.
- Perfect insertion alignment.



Tube grip up to 350 mm in the outside.



Rod grip from 40 mm to 300 mm.



Technical details:



Weight	
Complete structure:	Empty weight 2.600 Kg
Electrical system features	
Applied electric power:	7,5 KW
Tension:	380 V trifase
Frequency:	50 Hz
Electric motorizations	
Low/high pressure motor:	Asynchronous trifase 7,5 KW
Hydraulic plant	
Internal tank capacity:	150 real
Permitted fluids:	Oil ISO VG 32 or ISO VG 46
Max fluid temperature:	50°
Max tightening torque: 1.200 nm.	
The project includes tightening torque up to 1.500 nm.	



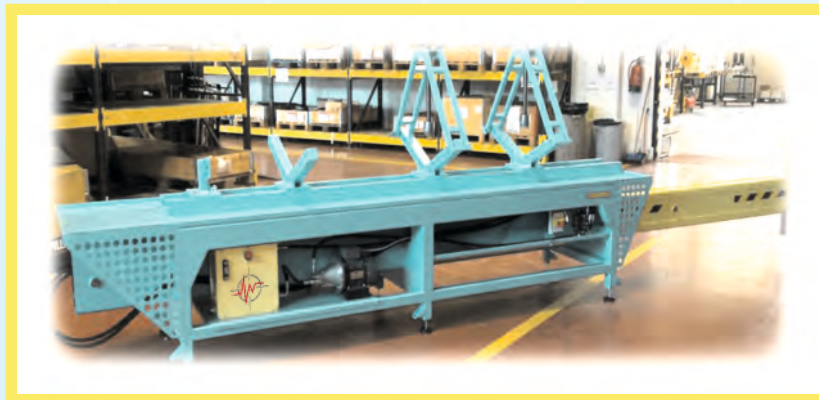
Hydraulic cylinder assembly bench **BMC**

Assembly bench **BMC1**



For cylinders weight up to 1000 kg and stroke up to 1500 mm.

Assembly bench **BMC2**



For cylinders weight up to 2500 kg and stroke up to 2000 mm. Jaw locking device of different shapes.

Assembly bench **BMC3**



For cylinders weight up to 5000 kg and stroke up to 3000 mm.

Accessory devices and components 1/3

Standard cylinder support unit
TTYSCC000010 for cylinders
weight up to 1 ton.



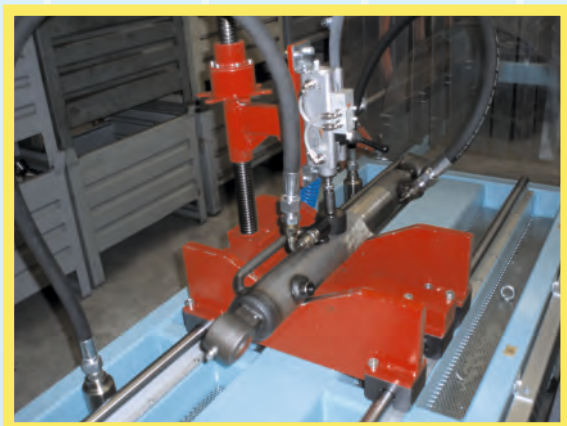
Standard cylinder support unit
TTYSCC000020 for cylinders
weight up to 2 ton.



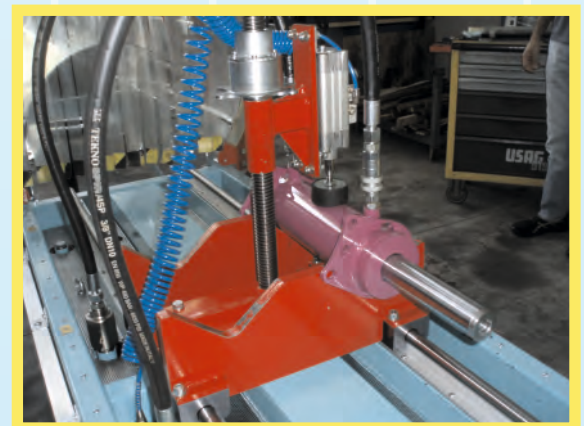
Standard cylinder support unit
TTYSCC000040 or cylinders weight up to 4 ton.



Single groove positioning stand.
ACSTT0000026

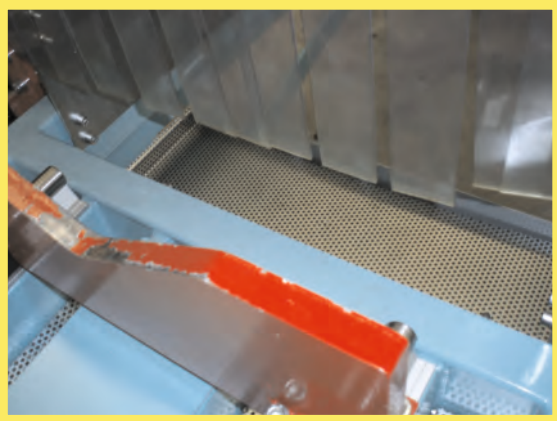


Double groove positioning stand
(one for testing and the other for dripping).
ACSTT0000027

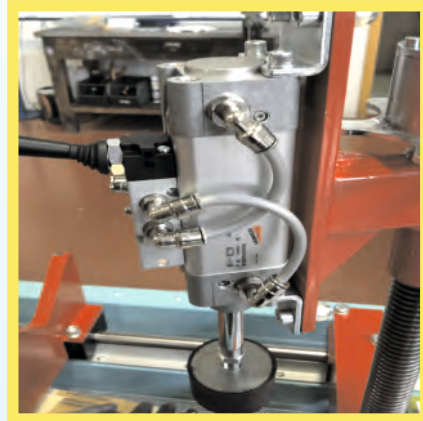


Accessory devices and components 2/3

Extended drip pan under rod side (B) of the cylinder.
ACSTT0000020



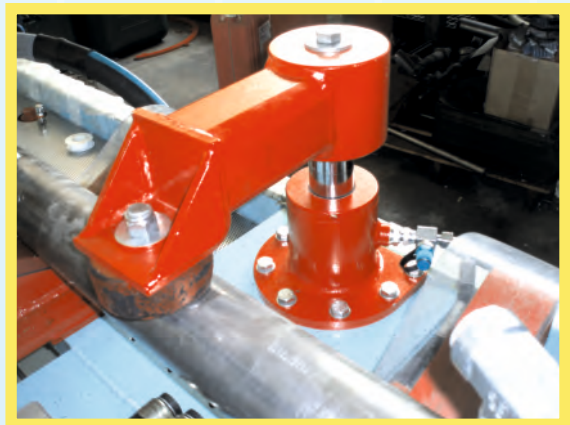
Cylinder locking system with pushing pneumatic cylinder.
ACSTT0000028



Cylinder locking system with pushing Hydraulic cylinder.
ACSTT0000029



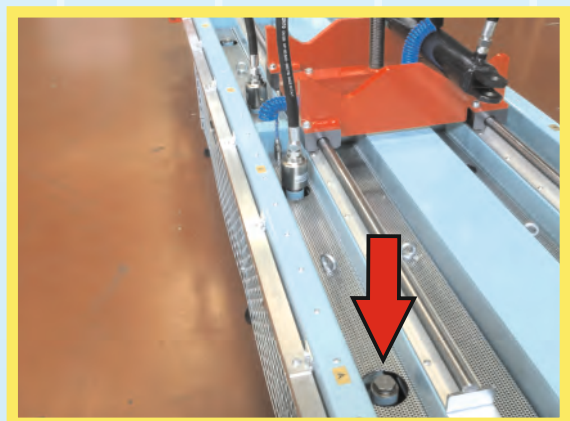
Cylinder locking system with pulling hydraulic cylinder.
ACSTT0000030



Rotating couplings up to 500 bar for A and B pipes.
ACSTT0000032



Possible port connection sizes:
1/4" - 3/8" - 1/2" - 3/4" 1".
ACSTT0000033



Accessory devices and components 3/3

Platform of light type with drip pan.
ACSTT0000035



Electric proportional
single axis joystick .
ACSTT0000040



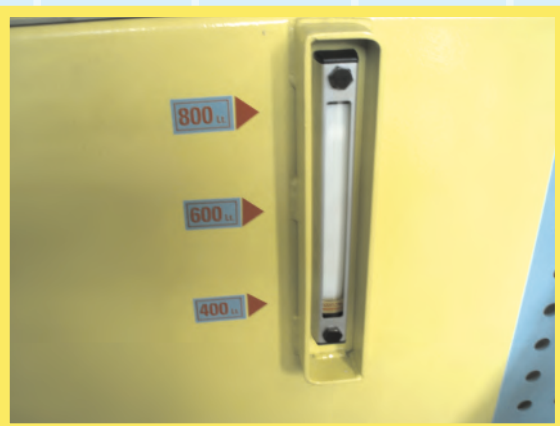
Fluid cleaning and
contamination control system.
ACSTT0000043



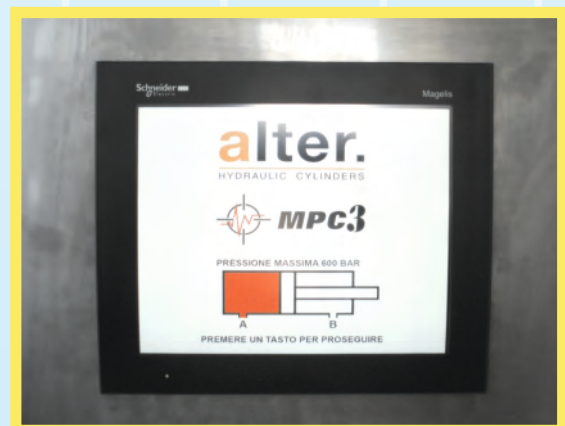
Air/oil separation system.
ACSTT0000047



Filtering system for tank
fill up and topping.
ACSTT0000048

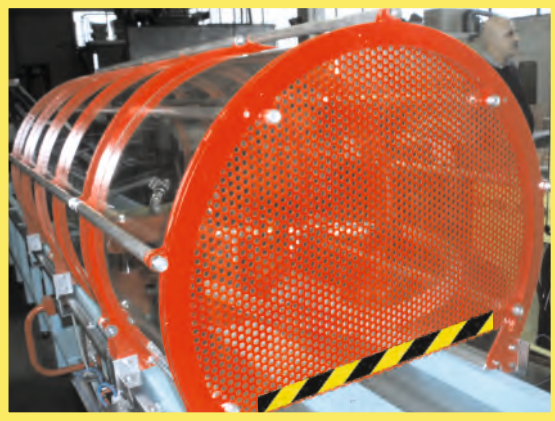


10" touch screen.
ACSTT0000090



Unit and optional components 1/3

Protection grid against end cup blow.
OPTTT000017



Interlocked grill protecting
from rod escape/expulsion.
OPTTT000018



Polycarbonate (PC)
protection of split type.
OPTTT000019



Closing cylinder of pneumatic type
(for plunger cylinders) with stroke
gauging system.
OPTTT000021



Internal Rod driving carriage.
OPTTT000023



External rod driving carriage.
OPTTT000024



Unit and optional components 2/3

Laser type linear sensor for rod stroke and position gauging.
OPTTT0000022



Heavy type grating platform with drip pan.
OPTTT0000036



Very large capacity drip pan with platform extended under the support unit.
OPTTT0000037



Grating flooring under service area with or without drip pan (to be quoted based on area layout).
OPTTT0000038



Additional Tank (200-400-600-1000 lt).
OPTTT0000039



2 axis removable Joystick with cable.
OPTTT0000041



Unit and optional components 2/3

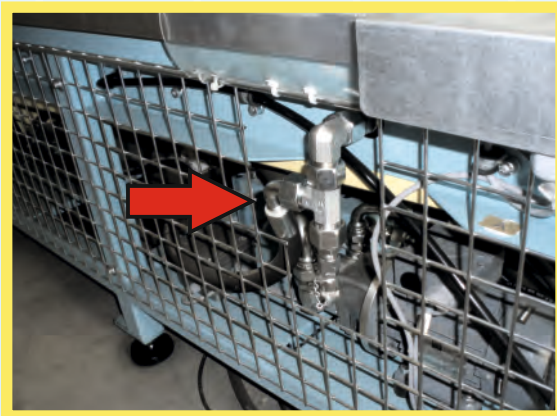
Laser type linear sensor for rod stroke and position gauging.
OPTTT0000022



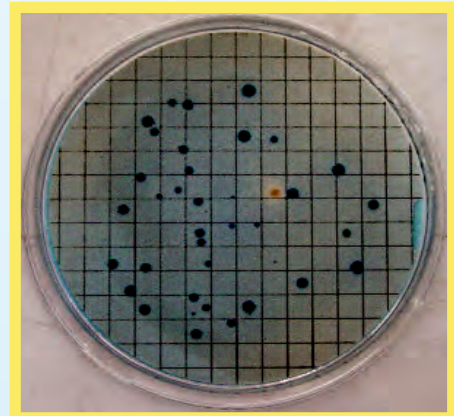
Heavy type grating platform with drip pan.
OPTTT0000036



Very large capacity drip pan with platform extended under the support unit.
OPTTT0000037



Grating flooring under service area with or without drip pan (to be quoted based on area layout).
OPTTT0000038



Additional Tank (200-400-600-1000 lt).
OPTTT0000039



2 axis removable Joystick with cable.
OPTTT0000041



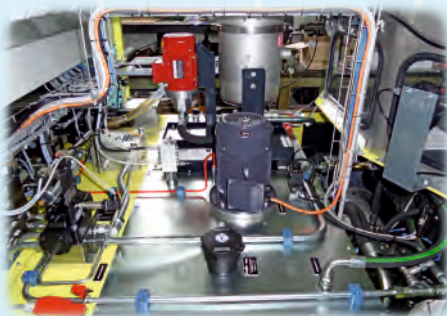


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