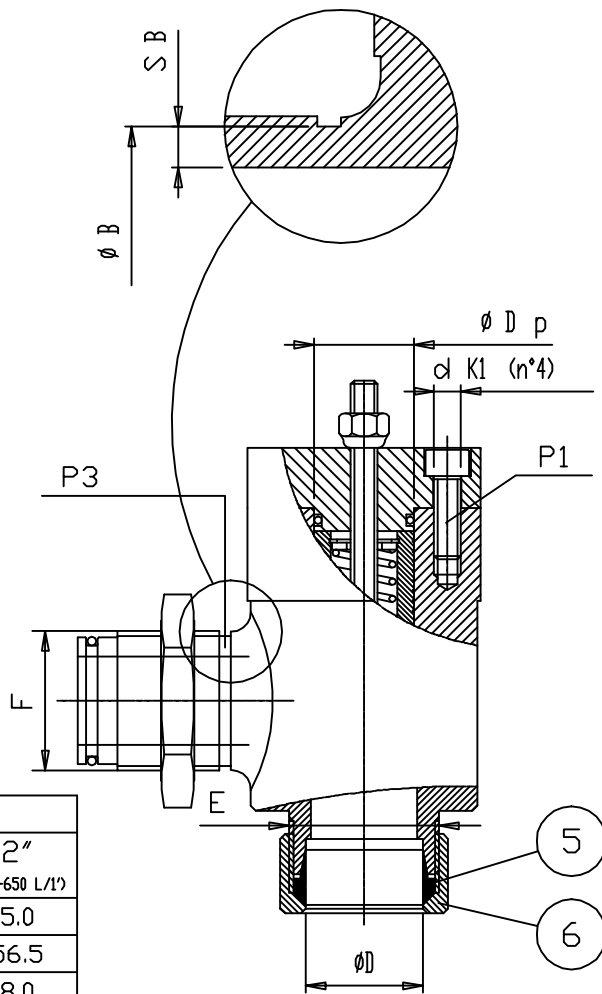


VERSION FOR ONLY  
VALVE TYPE: 2"



VALVE TYPE:  
3/4" - 1"1/4 - 1"1/2 - 2"

	VALVE TYPE				
	3/4" (8-23 L/1')	1"1/4 (15-150 L/1')	1"1/2 (151-380 L/1')	2" (381-650 L/1')	
BEGINNING DATA	α 3	/	/	/	5.0
	B	/	38.5	44.5	56.5
	α K1	6.0	8.0	8.0	8.0
	D	22.0	28.0   35.0	42.0	2" F
	D K2	6.0	/	/	/
	D o	27.2	/	/	/
	D p	22.0	30.0	40.0	53.0
	D s	/	/	/	65.0
	E	M M30x2	M M36x2   M M45x2	M M52x2	F 2" G
	F	/	1"1/4 G	1"1/2 G	2" G
	n°	4	4	4	4
	S B	/	6.00	4.75	4.75
	R <sub>p0.2</sub>	*	*	*	*
TUBO FLEX	3/4"	1"   1"1/4	1"1/2	2"	
MAX PRESSURES CALCULATED	P1	115.6	172.7	97.1	55.3
	P2	/	/	/	131.1
	P3	/	171.7	114.8	90.4
	P4	75.6	/	/	/

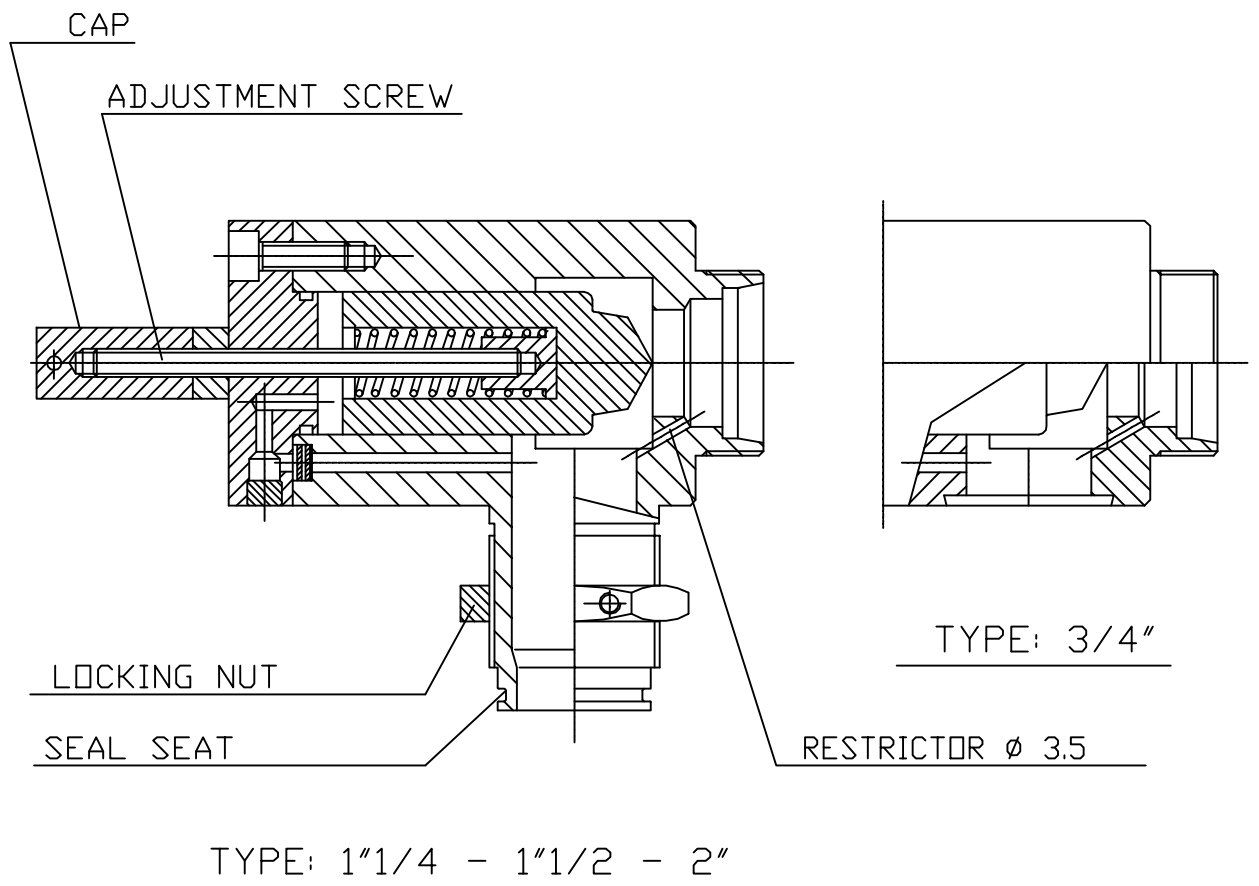
- THE MAX. WORKING PRESSURE OF EACH CYLINDER IS THE SMALLER AMONG THE INDICATED ONES (IN BAR)

\* { Fe370 R<sub>p0.2</sub> = 235 N/mm<sup>2</sup> YIELD TENSION MATERIAL VALVE BODY  
Fe370 R<sub>p0.2</sub> = 98 N/mm<sup>2</sup> RESISTANCE TO SHEARING STRESS RAM HEAD

UT

INITIAL DATA AND MAX PRESSURE CALCULATED FOR THE BLOCK VALVE INSPECTION / FLOW LIMIT

DATE 05/02  
DWG N. 9065/1



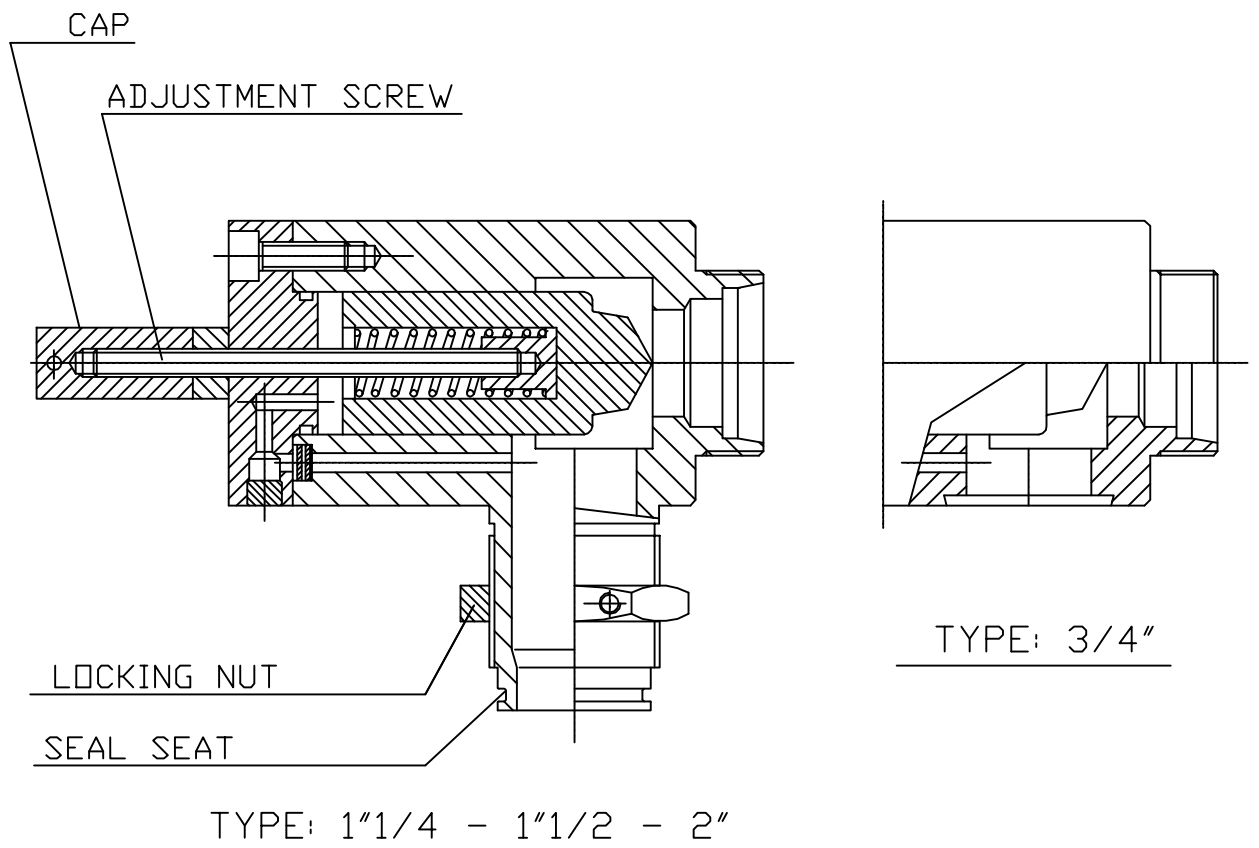
## OPERATING TEST

- A- PREPARE THE CAR FULLY CHARGED (SEE POINT 4) AND SEND IT TO THE HIGHEST LEVEL.
- B- LOCK ON THE DISTRIBUTOR GROUP SCREW N. 2 AND UNSCREW SCREW N. 8.  
(FOR VALVE 3/4" ONLY: SCREW N. 3 AND N. 8 IN SAFETY UNSCREW)
- C- SET A DOWNWARD RUNNING SO THAT THE CAR WILL GO DOWN FASTER THAN THE NOMINAL SPEED.
- D- THE VALVE MUST PREVENT THE CAGE DOWN STROKE FROM REACHING A VALUE EQUAL TO THE NOMINAL DOWN SPEED "Vd", INCREASED BY 0.3 n/s.
- E- WHEN THE CHECK HAS BEEN TERMINATED WITH THE CAR IN STOP POSITION, RESET THE ADJUSTMENT SCREW N.2 (UNSCREW OF 3.5 TURNS) AND N. 8 (FOR VALVE 3/4" ONLY: SCREW N. 3 AND N. 8) TO THE ORIGINAL CONDITION.

## NOTE:

- 1) IF DURING THE CHECK THE VALVE DOES NOT OPERATE TAKE OFF THE CAP AND THE ADJUST THE VALVE BY TURNING 1/4 OF A ROUND AT A TIME, REPEAT THE CHECK UNTIL IT FUNCTIONS.
- 2) THE VALVE CAN BE ORIENTATED IN ANY DIRECTION.
- 3) THE VALVE IS ALREADY CALIBRATED.
- 4) FOR SYSTEMS WITH TWO OR MORE PISTONS, EACH FITTED WITH A FLOW RELIEV VALVE, THE FIRST TEST MUST BE CARRIED OUT WITH A MIN. LOAD, BEFORE INCREASING THE WEIGHT UNTIL REACHING THE MAX. LOAD IN TWO POINTS AT LEAST (HALFWAY AND MAX.) TO CHECK THE OPERATION.

UT		FUNCTIONAL CHECKING OF THE ADJUSTABLE FLOW RELIEF VALVE	DATE	05/01
			DWG N.	9340



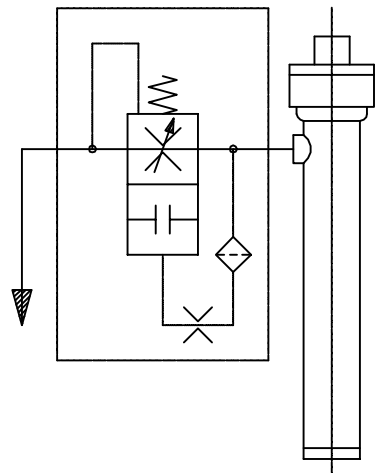
## OPERATING TEST

- A- PREPARE THE CAR FULLY CHARGED (SEE POINT 4) AND SEND IT TO THE HIGHEST LEVEL.
- B- LOCK ON THE DISTRIBUTOR GROUP SCREW N. 2 AND UNSCREW SCREW N. 8.  
(FOR VALVE 3/4" ONLY: SCREW N. 3 AND N. 8 IN SAFETY UNSCREW)
- C- SET A DOWNWARD RUNNING SO THAT THE CAR WILL GO DOWN FASTER THAN THE NOMINAL SPEED.
- D- THE VALVE MUST BE ABLE TO STOP THE DESCENDING CAB AND TO KEEP IT STILL AT THE LATEST WHEN THE SPEED REACHES A VALUE EQUAL TO THE NOMINAL DOWN STROKE SPEED "Vd" INCREASED OF 0.3 m/s.
- E- WHEN THE CHECK HAS BEEN TERMINATED WITH THE CAR IN STOP POSITION, RESET THE ADJUSTMENT SCREW N.2 (UNSCREW OF 3.5 TURNS) AND N. 8 (FOR VALVE 3/4" ONLY: SCREW N. 3 AND N. 8) TO THE ORIGINAL CONDITION.

### NOTE:

- 1) IF DURING THE CHECK THE VALVE DOES NOT OPERATE TAKE OFF THE CAP AND THE ADJUST THE VALVE BY TURNING 1/4 OF A ROUND AT A TIME, REPEAT THE CHECK UNTIL IT FUNCTIONS.
- 2) THE VALVE CAN BE ORIENTATED IN ANY DIRECTION.
- 3) THE VALVE IS ALREADY CALIBRATED.
- 4) FOR SYSTEMS WITH TWO OR MORE PISTONS, EACH FITTED WITH A STOP VALVE, THE FIRST TEST MUST BE CARRIED OUT WITH A MIN. LOAD, BEFORE INCREASING THE WEIGHT UNTIL REACHING THE MAX. LOAD IN TWO POINTS AT LEAST (HALFWAY AND MAX.) TO CHECK THE OPERATION.

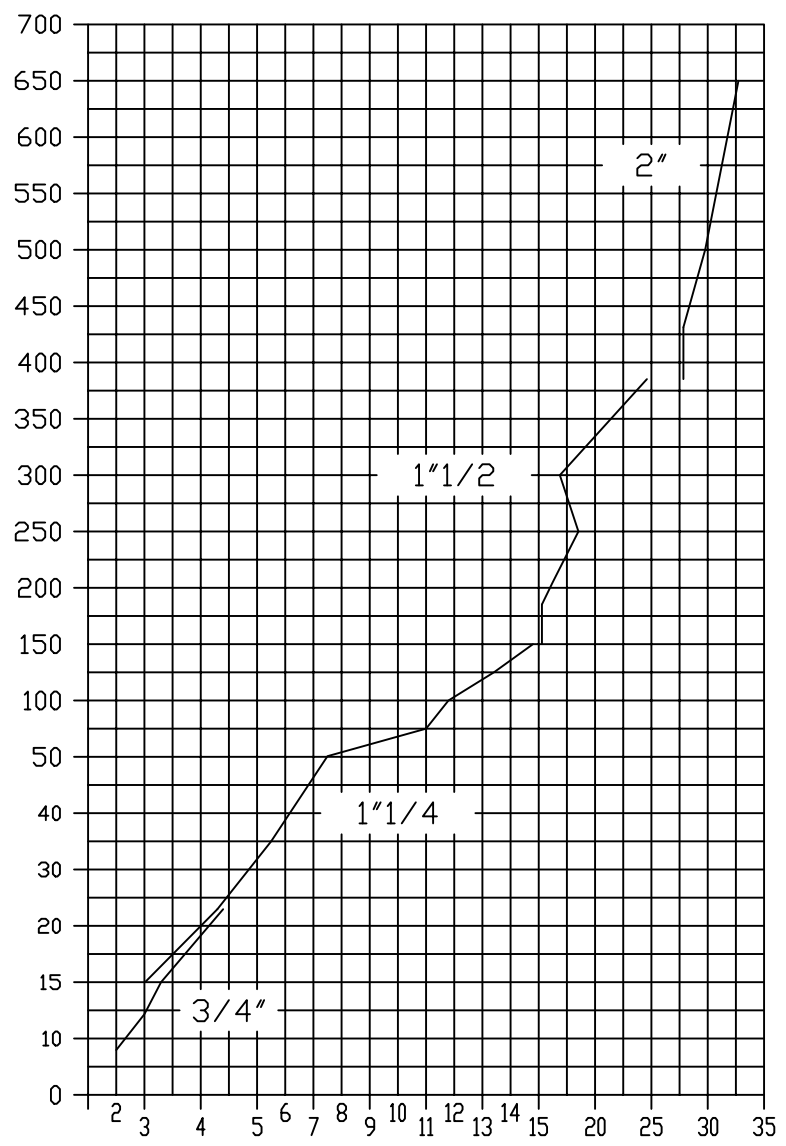
UT	FUNCTIONAL CHECKING OF THE ADJUSTABLE STOP VALVE 	DATE	05/01
		DWG N.	9345



- RAM SPEED AFTER VALVE INTERVENTION

$V_d = 0$  (m/s)

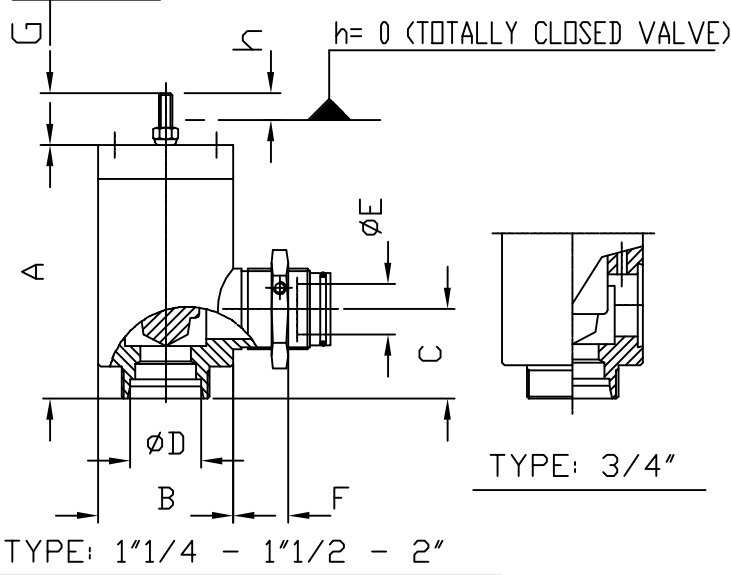
Qn (L/1') NOMINAL FLOW RATE DOWNWARD



VALUE BROUGHT FORWARD ON THE TESTING CERTIFICATE OF THE GEARCASE CONFORMING TO "EN 81.2"

NOTE: DATA TAKEN WITH:  
 - STATIC PRESSURE = 35 BAR  
 - OIL TEMPERATURE = 35°C

$h$  (mm)



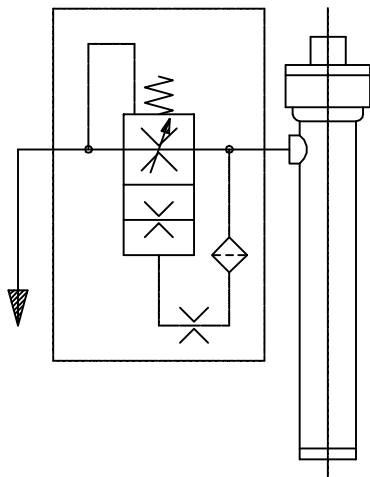
		3/4"	1" 1/4	1" 1/2	2"
Qn	MIN	8	15	151	381
	MAX	23	150	380	650
A		100	110	132	165
B		49x49	ø70	ø80	75x75
C		40	50	65	75
D		22	28   35	42	2"/F
E		18	25	30	40
F		/	24	24	24

UT

DIMENSIONING AND REGULATION OF THE ADJUSTABLE STOP VALVE

DATE 04/00  
 DWG N. 9346



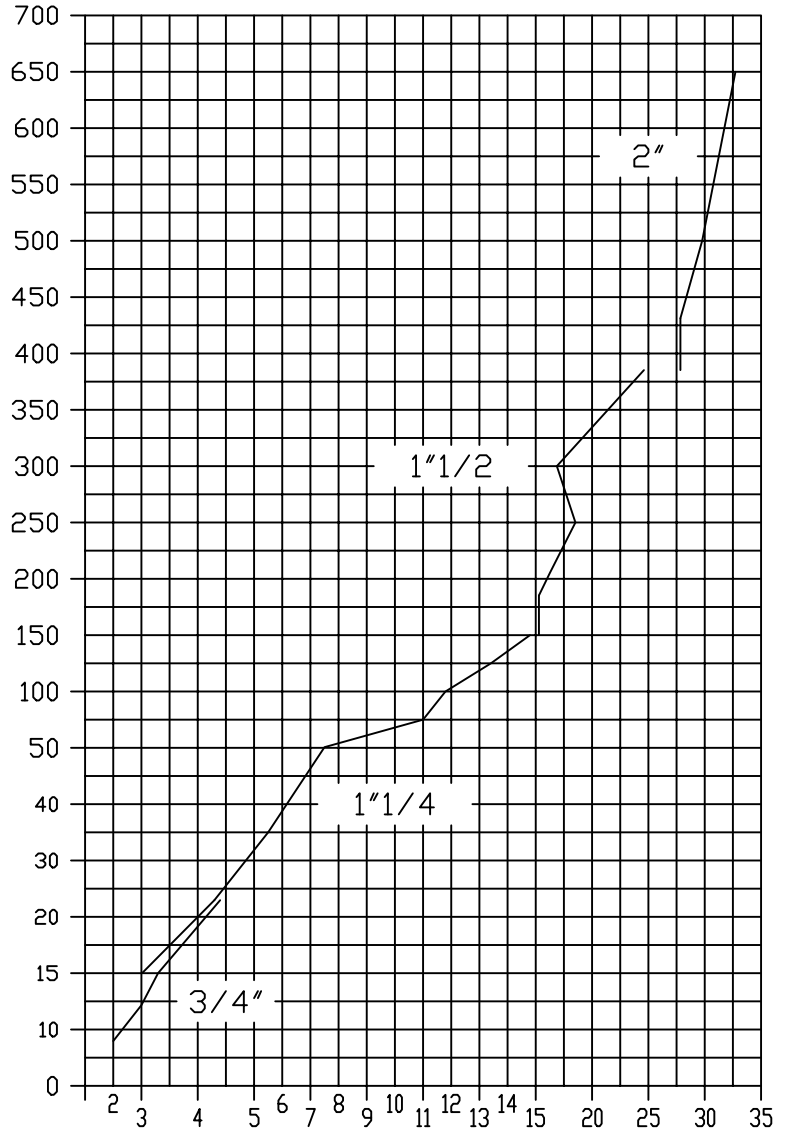


- RAM SPEED AFTER VALVE INTERVENTION

$$V_d = \frac{S_f \cdot \sqrt{p} \cdot 12.41}{d^2} \text{ (m/s)}$$

S<sub>f</sub> = HOLE SECTION (mm<sup>2</sup>)  
 p = MAX STATIC PRESSURE (BAR)  
 d = RAM OUTSIDE DIAMETER (mm)

Q<sub>n</sub> (L/1') NOMINAL FLOW RATE DOWNWARD

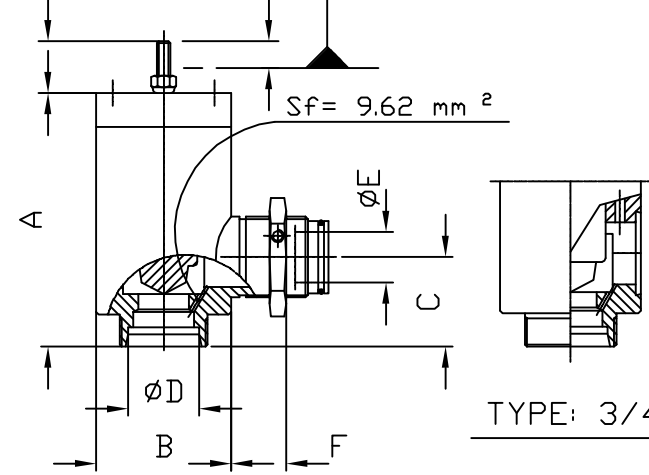


VALUE BROUGHT FORWARD ON THE TESTING CERTIFICATE OF THE GEARCASE CONFORMING TO 'EN 81.2'

NOTE: DATA TAKEN WITH:  
 - STATIC PRESSURE = 35 BAR  
 - OIL TEMPERATURE = 35°C

h (mm)

h = 0 (TOTALLY CLOSED VALVE)



TYPE: 3/4"

TYPE: 1 1/4 - 1 1/2 - 2"

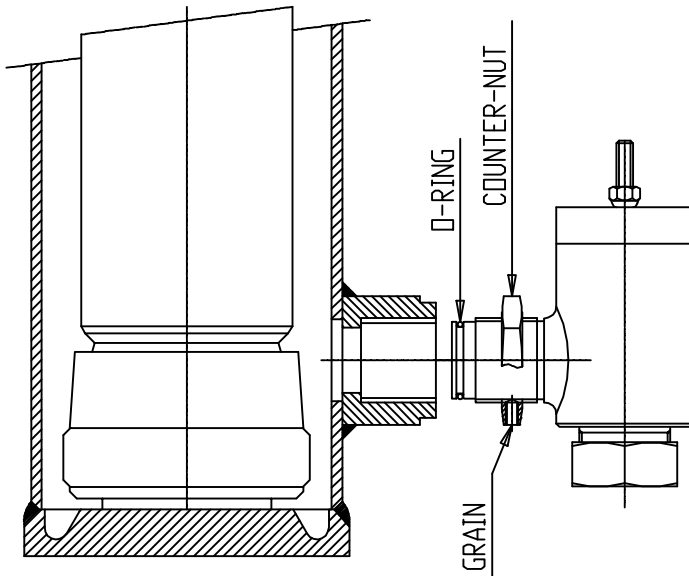
		3/4"	1 1/4"	1 1/2"	2"
Q <sub>n</sub>	MIN	8	15	151	381
	MAX	23	150	380	650
A		100	110	132	165
B		49x49	ø70	ø80	75x75
C		40	50	65	75
D		22	28   35	42	2"/F
E		18	25	30	40
F		/	24	24	24

UT

DIMENSIONING AND REGULATION OF THE FLOW RELIEF VALVE

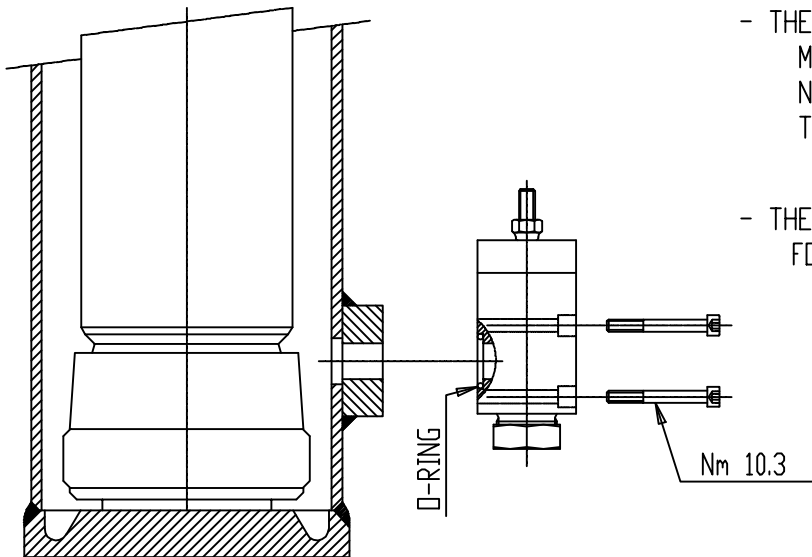
DATE 04/00  
 DWG N. 9347

TYPE 1 1/4 - 1 1/2 - 2"



- THE VALVE HAS TO BE DIRECTLY SCREWED ON PISTON UNTIL IT STOPS (MECHANICAL BEAT)
- POSSIBLE ORIENTATION ON 360° UNSCREWING IT BY ONE TURN (MAX POSSIBLE FOR O-RING SEAL)
- SCREW THE COUNTER-NUT UP TO MECHANICAL BEAT (SIDE OF THE UNION SOLDERED TO THE CYLINDER)
- SCREW THE GRAIN ON THE COUNTER-NUT, TO THE VALVE BODY

TYPE 3/4"



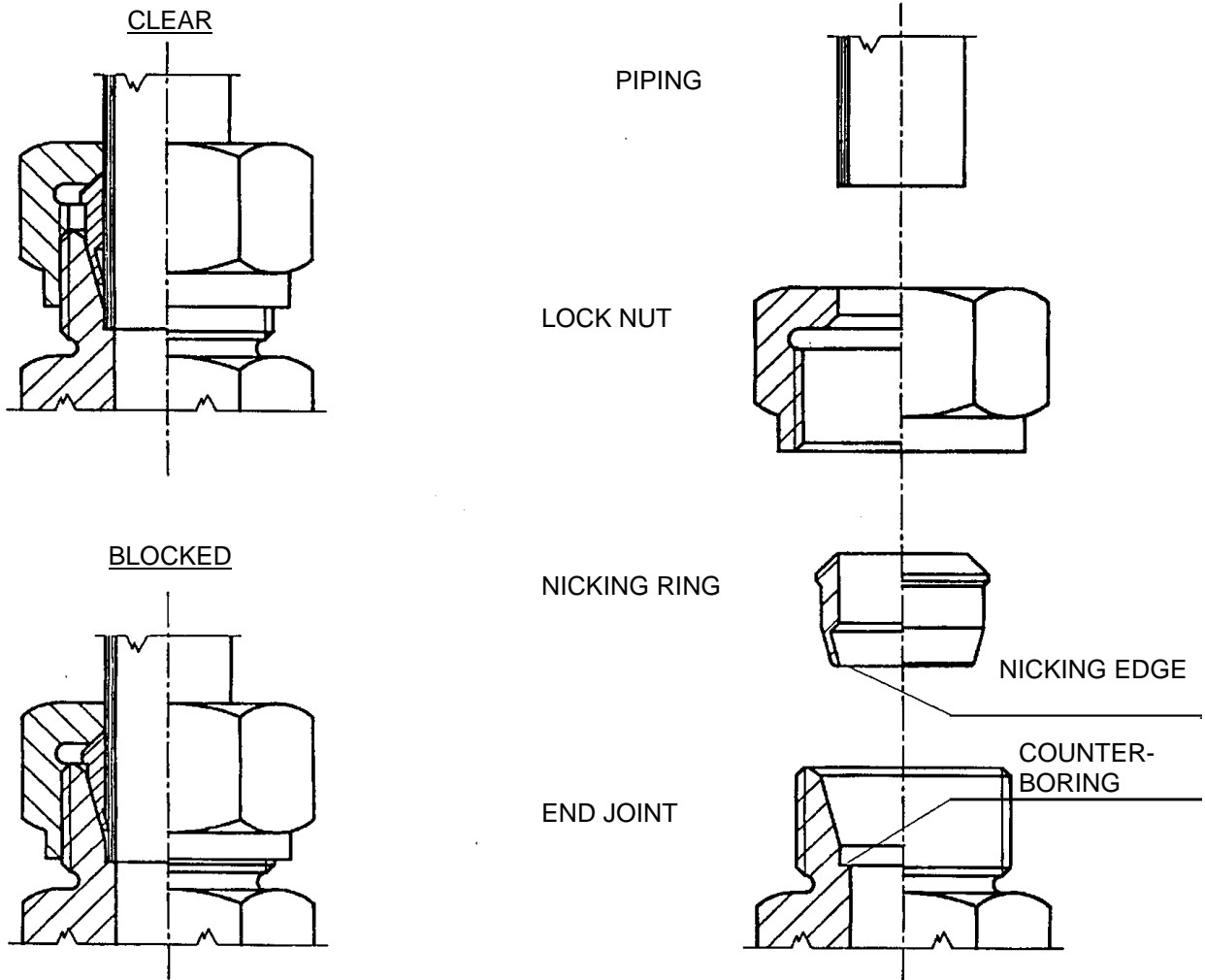
- THE VALVE HAS TO BE DIRECTLY MOUNTED ON THE PISTON USING No 4 M6 SCREWS (TIGHTENING TORQUE 10.3 Nm)
- THE ORIENTATION IS POSSIBLE FOR ALL 90°

NOTE: REMEMBER TO VERIFY THAT THE SEAL O-RING GASKET IT IS ALWAYS INSERTED

UT		PROCEDURE FOR MOUNTING THE ADJUSTABLE LOCKING VALVE	DATE	04/99
			DWG N.	9348

- A)** THE POWER UNIT MUST LAID ON VIBRATION-DAMPING MATERIAL (SEE ADJUSTABLE FEET INIDE THE UNIT).
- B)** TAKE CARE FOR INSTALLING THE FEED PIPE.
- CHOOSE THE SHORTEST PATH USING 90 DEGREES ELBOWS, OR COLD BEND THE PIPE USING A PIPE BANDER.
  - SEE DRAWING Nr. 9300.
- C)** CHECK THAT THERE AREN'T TRACES OF CONDENSATION OR DAMPNES INSIDE THE UNIT, OTHERWISE WARM IT.
- D)** WHEN THE CONNECTION ARE TERMINATED, FILL THE UNIT TANK WITH OIL; THE MAXIMUM LEVEL IS INDICATED ON THE MOTOR SUPPORTING BRACKET.
- E)** DURING THE FIRST MOTOR/PUMP STARTUP, CHECK WHETHER THE NOISE IS TOO HIGH, IN THIS CASE THE PHASES BY THE ELECTRIC BOARD INPUT MUST BE INVERTED.
- F)** BLEED THE AIR OUT OF THE CYLINDER, BY LOOSENING INTERMITTENTLY THE BLEEDING SCREW PLACED ON THE CYLINDER HEAD; CONTINUE AT LOW SPEED UNTIL THE OIL COMES OUT AIRLESS.
- THIS OPERATION MUST BE REPEATED SEVERAL TIMES AFTER THE INSTALLATION TO BLEED ALL THE AIR.
- G)** WITH THE ROD COMPLETELY EXTENDED, CHECK THAT THE MINIMUM OIL LEVEL ISN'T BELOW THE MARK ON THE MOTOR SUPPORTING BRACKET (THE MOTOR/PUMP MUST BE IMMersed).

UT				DATA	04/90
			<b>INSTRUCTIONS FOR POWER UNIT ASSEMBLING</b>	N.DIS	<b>9280</b>



- 1) FOLLOW THE CUT OF THE PIPE CLOSELY AT RIGHT ANGLES.
- 2) THE PIPE MUST BE FREE OF BURR OR ANY INTERNAL IMPURITIES.
- 3) THE RING AND THREADS MUST BE LUBRICATED DURING INSTALLATION.
- 4) FIRSTLY INSERT THE LOCK NUT AND THEN THE NICKING RING WITH THE NICKING EDGE TURNED TOWARDS THE END JOINT.
- 5) THE PIPE MUST THEN BE INSERTED INTO THE END JOINT AND MUST REST AGAINST THE COUNTERBORING. THE LOCK NUT MUST THEN BE TIGHTEND BY HAND AS FAR AS POSSIBLE.
- 6) TAKE A SPANNER WITH AN EXTENSION, AND TIGHTEN THE LOCK NUT AT LEAST 1 AND  $\frac{1}{2}$  TURNS UNTIL THE NICKING EDGE TOUCHES THE PIPE (AS SHOWN ABOVE)
- 7) LOOSEN THE LOCK NUT, CHECKING THAT THE NICKING RING IS ABOUT 5 mm PROJECTING FROM THE PIPE OUTSIDE: CHECK THAT IT DOES NOT MOVE FROM THIS POSITION, AND THAT AT THE NICKING POINT THERE IS AN EVEN RIM THAT SHOWS THE OCCUREDE NICKING.
- 8) PROCEED WITH THE TIGHTENING AND BLOCKING OF LOCK NUT.

UT

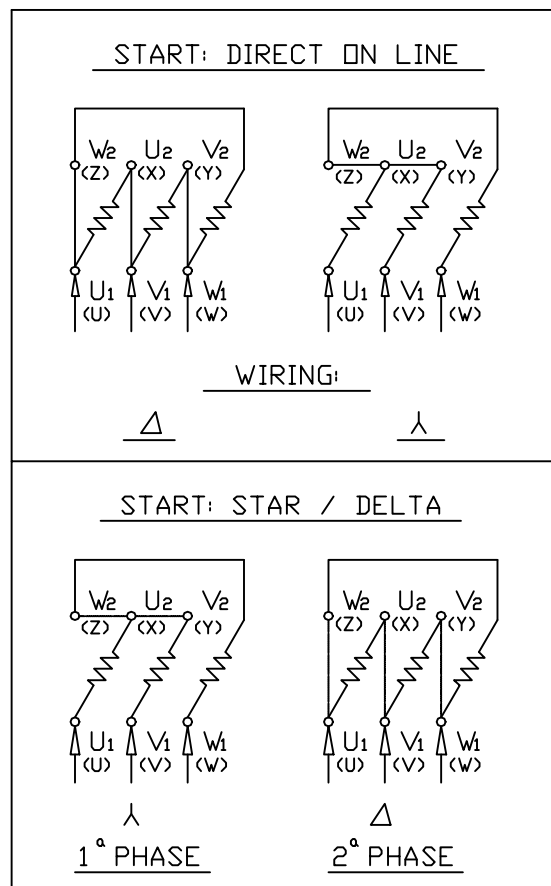
**INSTRUCTIONS FOR THE CORRECT  
INSTALLATION OF THE PIPE-WORK**

DATA 04/90

N.DIS 9300

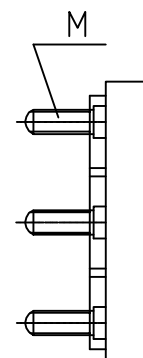
1		MOTOR THERMOSTAT OIL THERMOSTAT AT 70 °C (MAX 2.5 V)
2		
3	C.E. + C.E.M.	COMMON COILS 48/80 Vcr - 12 Vcc
4	E.A	UP/DOWNWARD HIGH SPEED VALVE
5	E.B	DOWNWARD VALVE
6	EM.-E.A	(**)
7	EM.-E.B	DOWNWARD EMERGENCY COIL
8	E. λ/Δ	STAR DELTA VALVE
9		
10		
11		220 V PREHEATING OIL DISTRIBUTOR
12		

∅i4



\*

MOTOR POWER		PUMP	M
CV	Kw	L / 1'	
2-20	1.5-15	15-150	M6
13-50	9.5-37	180-650	M8
60-100	45-75	440-650	M10



- E.A  
E.B  
E. λ/Δ
- VALVES (STAR/DELTA ON REQUEST)
- C.E. - COMMON VALVE  
C.E.M. - COMMON EMERGENCY VALVE  
EM. - EMERGENCY
- E.A-E.B-E. λ/Δ - NORMAL USE 48V. RECTIFIED CURRENT-BLACK WIRE  
E.A-E.B - AUTOMATIC USE IN EMERGENCY 12 V.  
DIRECT CURRENT-WHITE WIRE

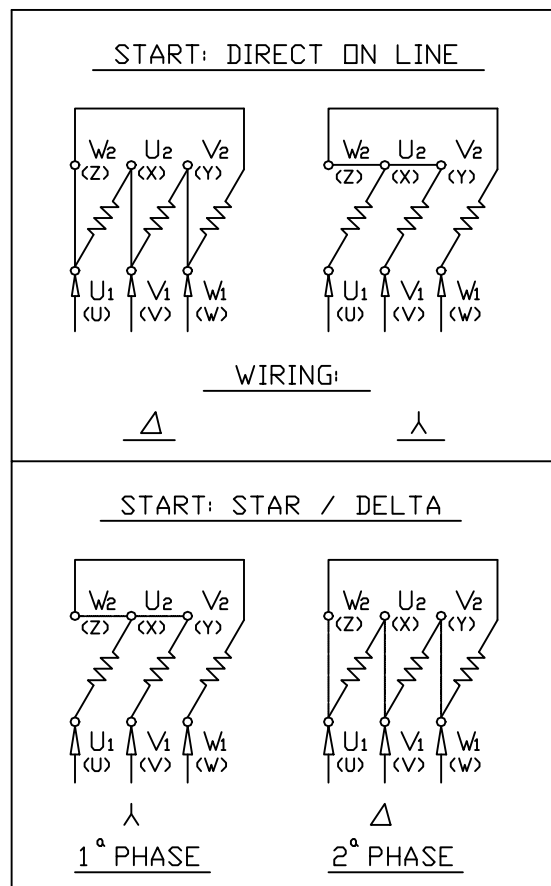
\* NOTE: CONNECT DURING WINTER / COLD MONTHS (220V. - 50W.)

(\*\*) FOR DOWNWARD HIGH SPEED JUMP WITH EM.-E.B

UT		ELECTRICAL WIRING IN THE POWER UNIT	DATE	01/99
			DWG N.	9310

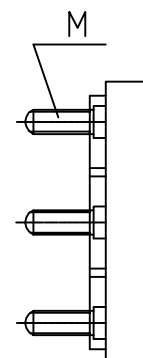
1		MOTOR THERMOSTAT (MAX - 2.5 V)
2		
3	C.E. + C.E.M.	COMMON COILS 48/80 Vcr - 12 Vcc
4	E.A	UP/DOWNWARD HIGH SPEED VALVE
5	E.B	DOWNWARD VALVE
6	EM.-E.A	(**)
7	EM.-E.B	DOWNWARD EMERGENCY COIL
8	E. λ/Δ	STAR DELTA VALVE
9	T	OIL THERMOSTAT AT 70°C
10		
11		220 V PREHEATING OIL DISTRIBUTOR
12		

∅i4



\*

MOTOR POWER		PUMP	M
CV	Kw	L / 1'	
2-20	1.5-15	15-150	M6
13-50	9.5-37	180-650	M8
60-100	45-75	440-650	M10

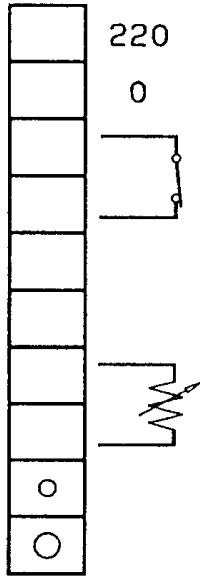


- E.A  
E.B  
E. λ/Δ
- VALVES (STAR/DELTA ON REQUEST)
- C.E. - COMMON VALVE  
C.E.M. - COMMON EMERGENCY VALVE  
EM. - EMERGENCY
- E.A-E.B-E. λ/Δ - NORMAL USE 48V. RECTIFIED CURRENT-BLACK WIRE  
E.A-E.B - AUTOMATIC USE IN EMERGENCY 12 V. DIRECT CURRENT-WHITE WIRE

\* NOTE: CONNECT DURING WINTER / COLD MONTHS (220V. - 50W.)

(\*\*) FOR DOWNWARD HIGH SPEED JUMP WITH EM.-E.B

UT		ELECTRICAL WIRING IN THE POWER UNIT (TE.SEP)	DATE	01/99
			DWG N.	9310/1

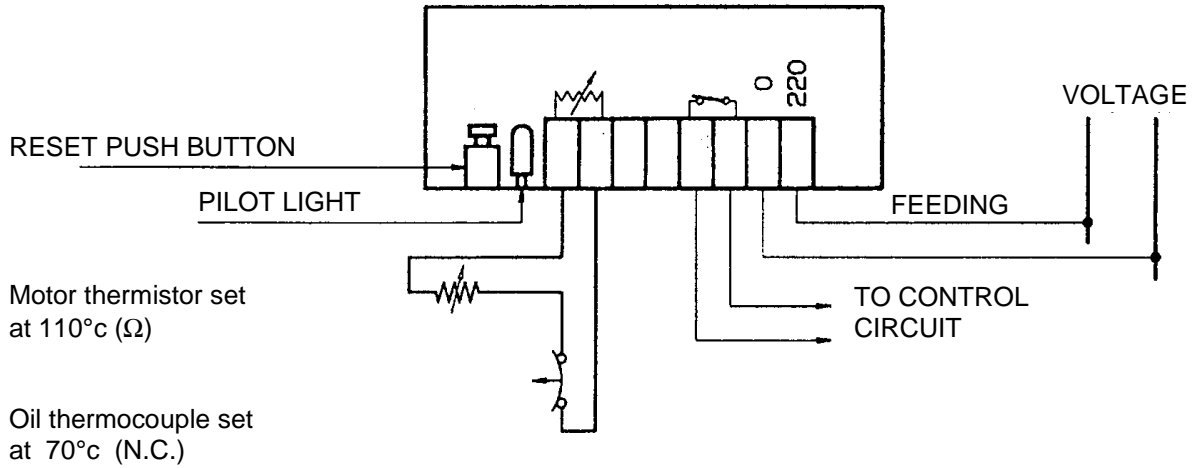


FEEDING TERMINALS OF TERMINAL BOARD M.P.A.

MOTOR THERMISTORS CONNECTION  
(TERMINALS ON THE POWER UNIT)

PILOT LIGHT

RESET PUSH-BUTTON



ON THE M.P.A. BOX A PILOT LIGHT SHOWS THE TRIPPING OF THE CIRCUIT, WHILE A PUSH-BUTTON IS PROVIDED FOR RESETTING.  
MAXIMUM CURRENT IMPULSE WHEN THE CONTROL CIRCUIT IS INTERRUPTED:

3 A. - 60 V. dc. (INDUCTIVE)  
1 A. - 100V. dc.

PRELIMINARY TESTS

AFTER COMPLETING THE WIRING, CONNECT POWER AND THEN DISCONNECT A WIRE OF THE MOTOR TERMISTOR.  
PILOT LIGHT MUST LIGHTS AND THE CONTROL CIRCUIT BREAKS .

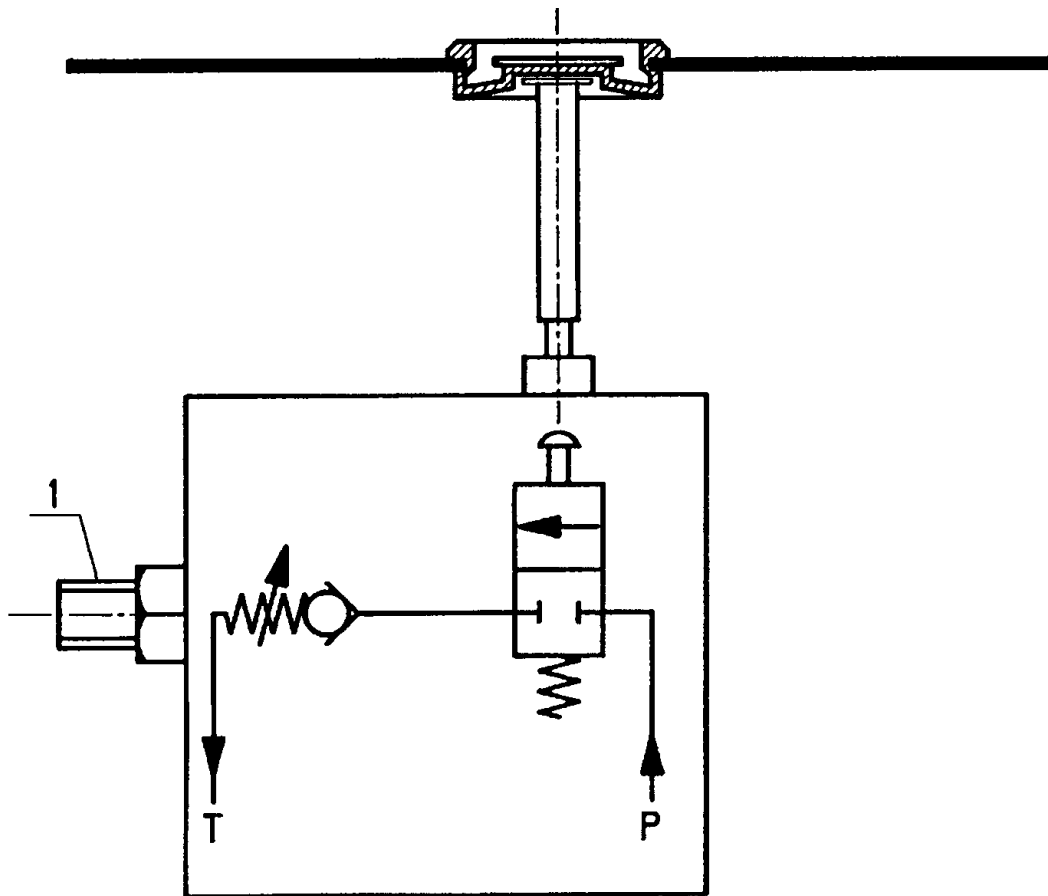
TRIPPING TIME IN SINGLE-PHASE TESTS

FROM 50°C TO 100°C - 6" TO 10"  
FROM 20°C TO 100°C - 8" TO 10"

UT	

**MOTOR PROTECTION AMPLIFER (M.P.A.)  
WIRING DIAGRAM**

DATA	07/92
N.DIS	9311



BY PRESSING THE RED PUSH BUTTON PLACED ON THE POWER UNIT COVER, THE MANUAL DESCENT OF THE ROD COMES INTO EFFECT.

IO ORDER TO TEST THIS CORRECTLY, CARRY OUT THE FOLLOWING PROCEDURE:

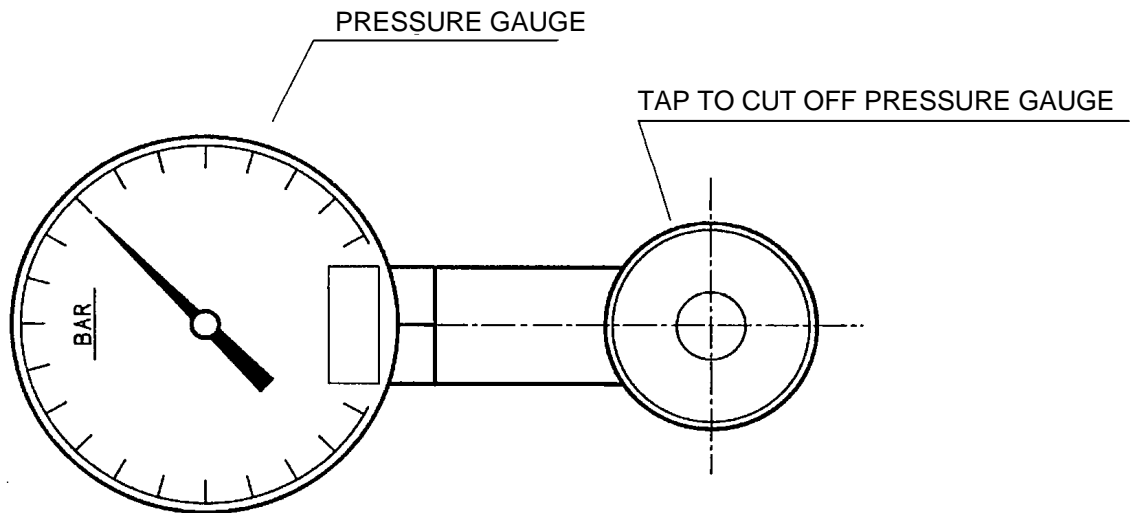
- A) BLOCK THE CAR USING THE RELEVANT SAFETY MEANS.
- B) PRESS THE RED PUSH BUTTON FOR MANUAL DESCENT OF ROD.
- C) THE ROD SHOULD NOT DESCEND.
- D) IF IT DOES, TIGHTEN SCREW N. 1 UNTIL IT REMAINS STILL.
- E) RELEASE THE SAFETY MEANS, SO THAT THE CAR FUNCTIONS NORMALLY.
- F) CHECK THAT WHEN PRESSING THE RED PUSH BUTTON, EVERYTHING FUNCTIONS REGULARLY.

UT

**MANUAL DESCENT CONTROL OF ROD, USING  
SAFETY MEANS ON INDIRECT SIDE ACTING 2:1  
ROPED INSTALLATIONS**

DATA 04/90

N.DIS 9360



TOP VIEW

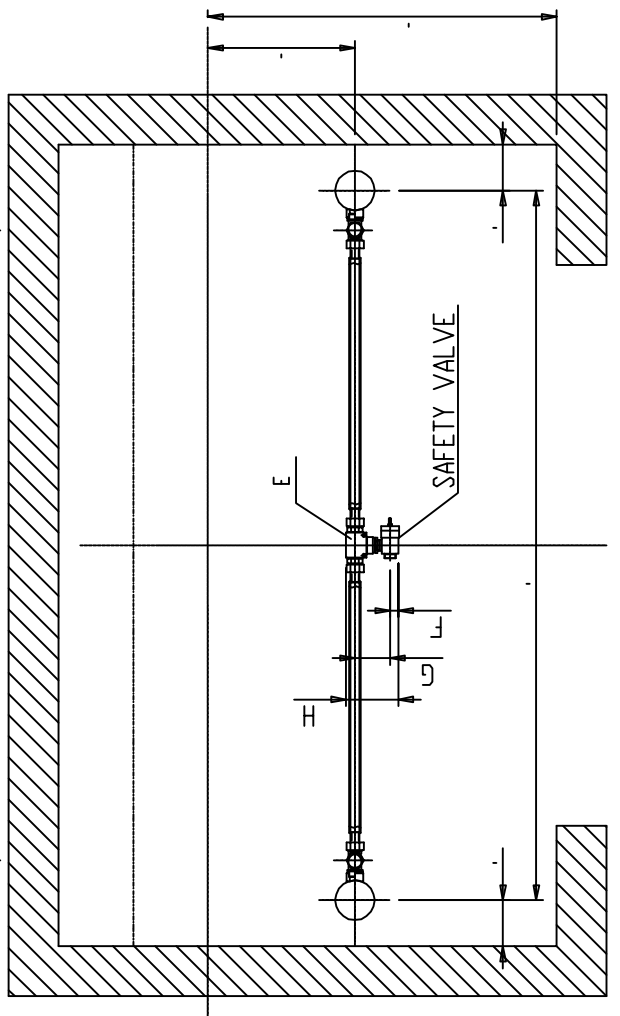
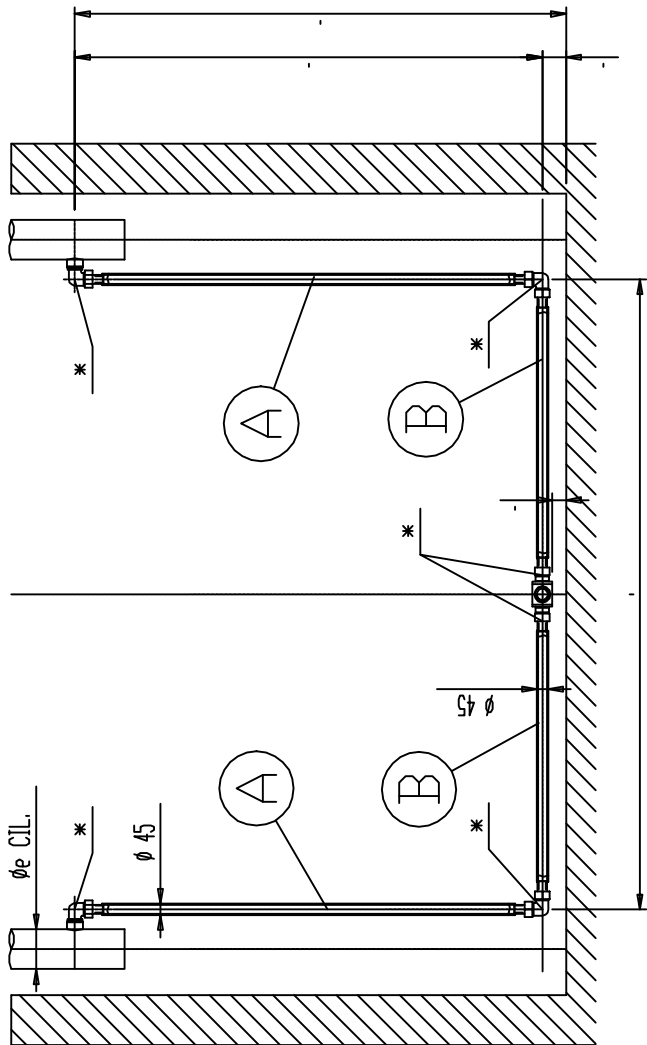
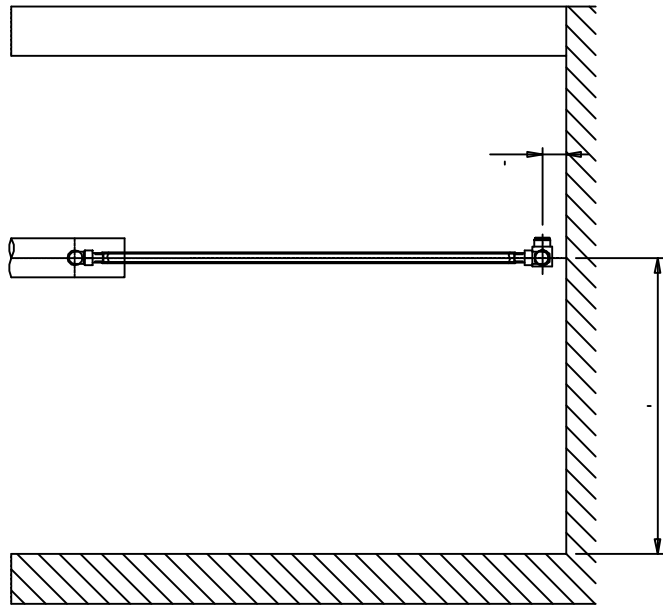
- A) MAKE SURE THAT THE TAP TO CUT OFF THE PRESSURE GAUGE IS CLOSED.
- B) REMOVE THE PRESSURE GAUGE.
- C) INSERT THE DELIVERY CONNECTION FOR THE HAND PUMP.
- D) OPEN THE TAP TO CUT OFF THE PRESSURE GAUGE.
- E) OPEN THE TAP OF THE HAND PUMP DELIVERY FOR ABOUT 1 MINUTE.
- F) CLOSE IT.
- G) EXTEND THE RAM TO ITS FULL LENGTH, THUS RELEASE THE VALVE OF MAXIMUM PRESSURE.
- H) ACTIVATE THE HAND PUMP UNTIL THE DESIRED PRESSURE IS ATTAINED.
- I) WHEN THE TEST HAS BEEN COMPLETED, ELIMINATE THE PRESSURE EXCESS BY PRESSING THE EMERGENCY MANUAL DESCENT PUSH BUTTON.
- L) TURN OFF THE TAP OF THE PRESSURE GAUGE.
- M) REMOVE THE CONNECTING PIPE FOR MANUAL FUNCTION AND REINSERT THE PRESSURE GAUGE.

UT		
----	--	--

**TEST OF INSTALLATION AT  
TWICE STATIC PRESSURE**

DATA	04/90
------	-------

N.DIS	<b>9370</b>
-------	-------------



SAFETY VALVE	
1" 1/4	1" 1/2
0939/1/4	0939/1/2
F 35	40
G 133	138
H 208	218
CUSTOMER'S REQUEST	<input type="checkbox"/>

\* — 'DIN 2353' CONNECTION

CUSTOMER'S \_\_\_\_\_ PURCHASE ORDER NR \_\_\_\_\_

UT \_\_\_\_\_

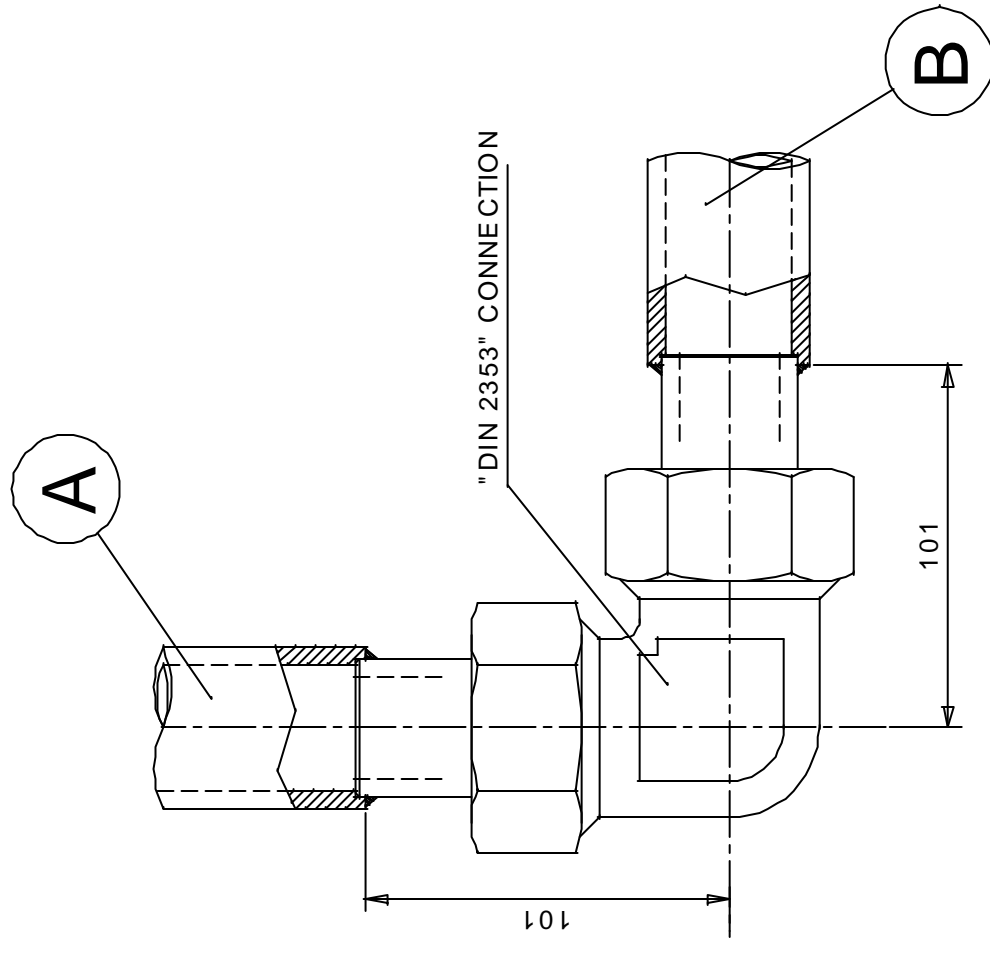
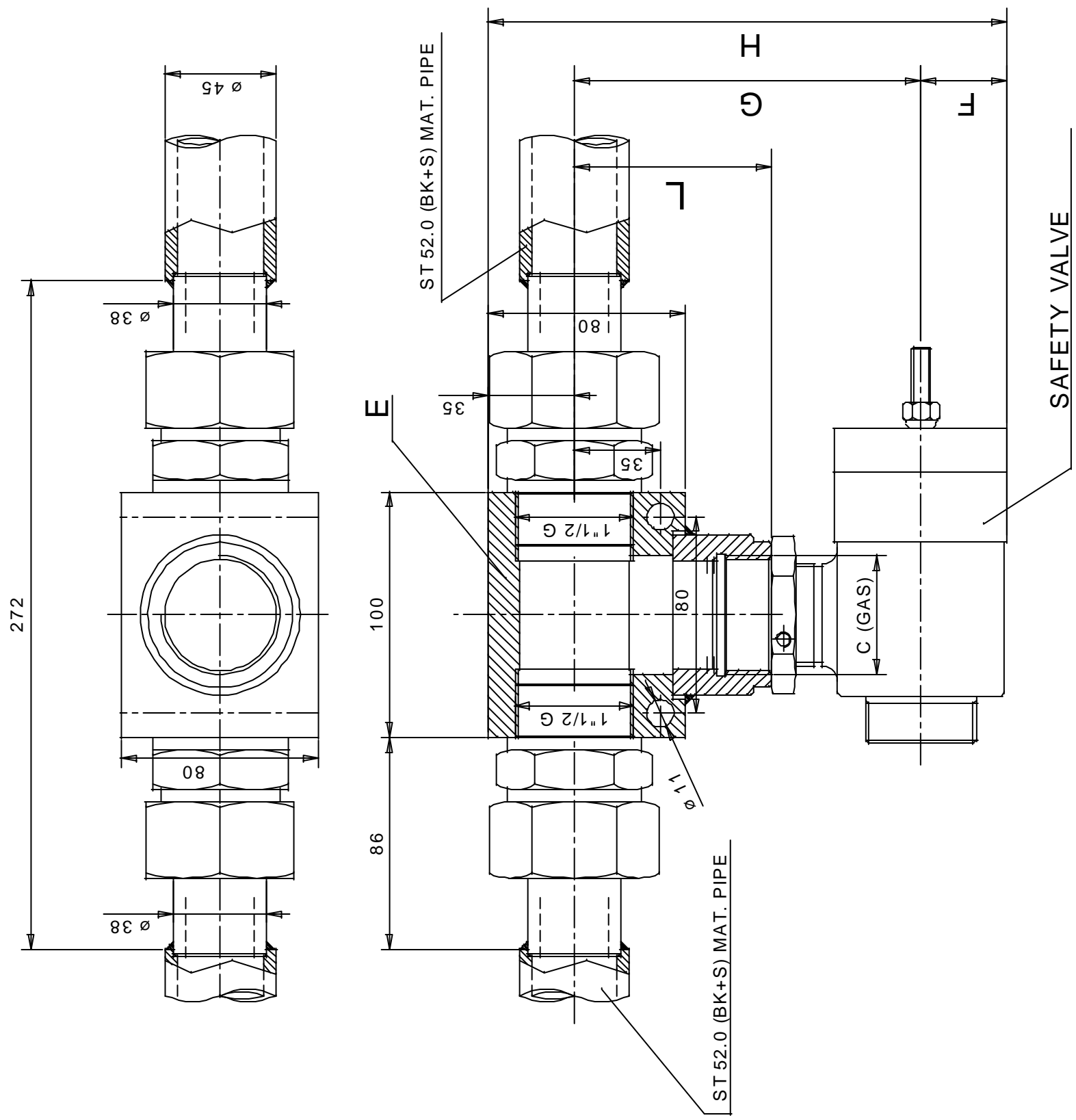
RIGID COUPLING BETWEEN TWO PISTONS  
AND A SAFETY VALVE

DATE 04/00  
DWG NR 9302/1

UT

RIGID COUPLING BETWEEN TWO PISTONS  
AND A SAFETY VALVE

DATE 04/03  
DWG N. 9302/2



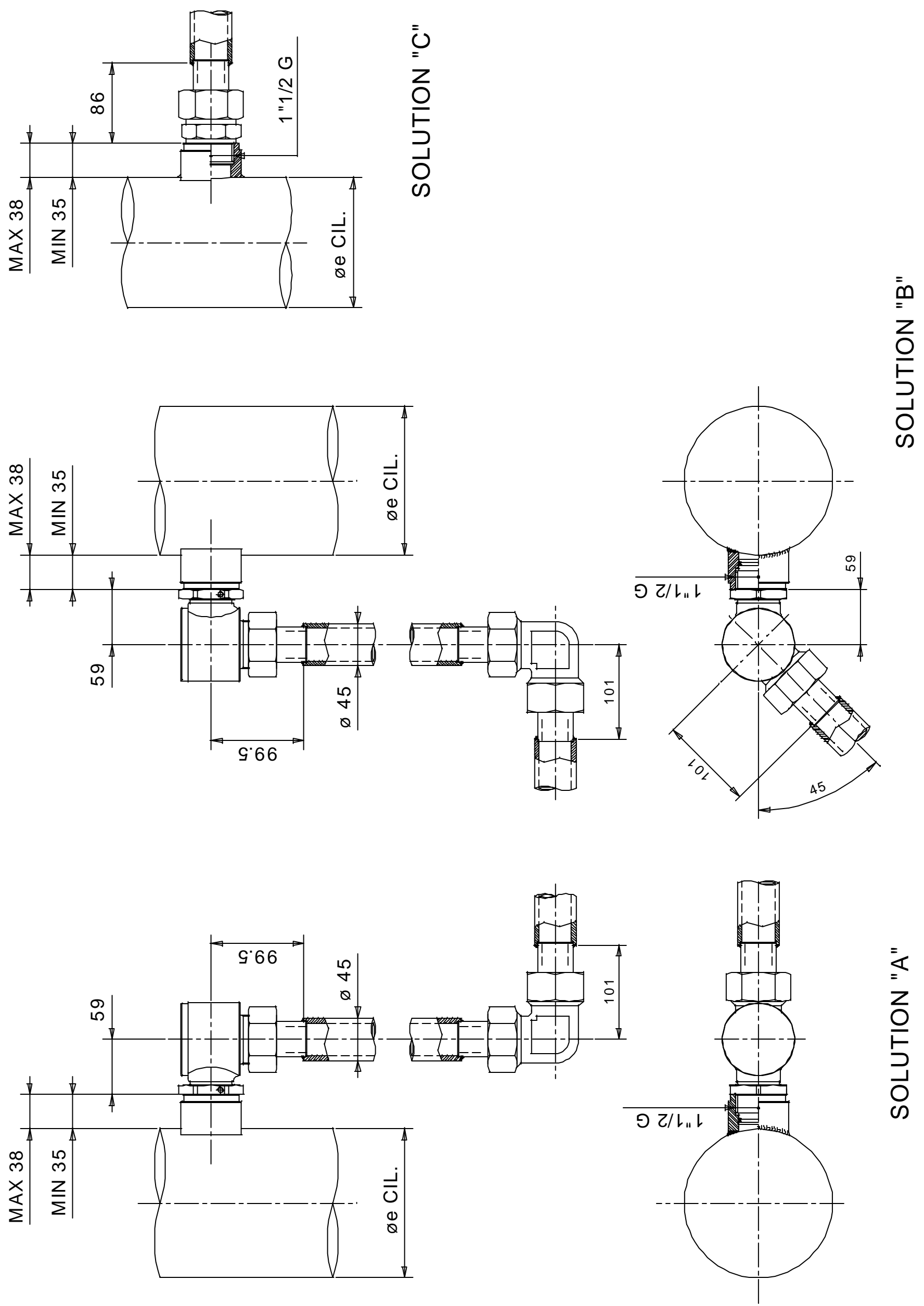
90° CONNECTION DETAIL

	SAFETY VALVE		
	TYPE 1" 1/4	TYPE 1" 1/2	TYPE 2"
C	1" 1/4	1" 1/2	2"
E	0939/1" 1/4	0939/1" 1/2	0939/2"
F	35	40	37.5
G	133	138	142
H	203	213	214.5
L	80	80	84
CUSTOMER'S REQUEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

UT	

RIGID COUPLING BETWEEN TWO PISTONS  
AND A SAFETY VALVE

DATE	04/03
DWG. NR.	9302/3



SOLUTION "A"

SOLUTION "B"

SOLUTION "C"