SDI 630

Operating Manual

This manual includes technical information only.

ITS has the right to make any modifications without any notice

SDI 630

Hydraulic operated Tees derivation machine (pipe-pipe derated 0.7) suitable for fabrication fo tee derivation range D. 90x315 to 315x630mm.

I.T.S. Ital Trade Services S.r.l.

Via Scarsellini 77
16149 – Genova , Italy
Tel: +39-010-6423396
Fax: +39-010-6423513
E Mail info@its-tecnodue.com

CE

SDI 630

VOLT	230
HZ	50/60
KW	8,4
A	35

SAFETY RULES ACCORDING TO DIRECTIVE CEE

(To be read carefully and apply while utilizing the SDI 630)

Due to the specific use, this machine cannot be supplied with all kind of fix and removable protections suitable to avoid any risk of accident.
The machine, therefore, must be utilised, adjusted and keep in the perfect functioning conditions by skill operators.

Warning - Rules - Obligations

1.Transport
Keep the maximum care, utilising mechanical aids, to move the machine.
2.Electric connections
The machine is operated by 230 Volts therefore be sure that the power supply plug is supplied with the safety devices according to the standard requirements , also check that the power supply will be on the range of maximum 10% of the machine's nominal tension.
Check regularly the cables and the plug and in case substitute by qualify personnel.
In case the heating mirror cable must be substitute the cable must be **H07RN-F**
3.Environmental conditions
The working area must be clean and duly lighted.
It's very dangerous to utilise the machine in case of rain or in wheat conditions or even close to flammable liquids.
4.Clothes
Keep the maximum care while utilising the machine due to the high temperature involved on the heating mirror always more than 200°C , it's strongly suggested to use suitable gloves.
Avoid long clothes and avoid bracelets , necklaces that might be hooked into the machine.
5.Correct machine's operation
Remember to check and read carefully the operating manual before utilising the machine and the accessories.
6.Keep always attention
After the heating mirror has been disconnected temperature will be hot for some minutes
Keep the maximum care while utilising the facing tool. Be careful to the blades , it's strongly suggested to use suitable gloves.
Avoid utilising the machine after drinking or drugs use
Take care that all the people around the machine are at safety distance
While starting operating take care to avoid leave arms between the movable and fix trolleys.
7. Acoustic pollution
The acoustic pollution of the drill engine is less than 85 dB (value measured at 1 meter distance from the operator)
Due to some particular cases such as too much pressure during the facing the noise should be increased therefore it's suggested to utilise acoustic protections.
IMPORTANT !!!!
Keep the maximum care reading and following the above Warning - Rules - Obligations the Ital Trade Services S.r.l. decline all responsibilities if are not followed totally

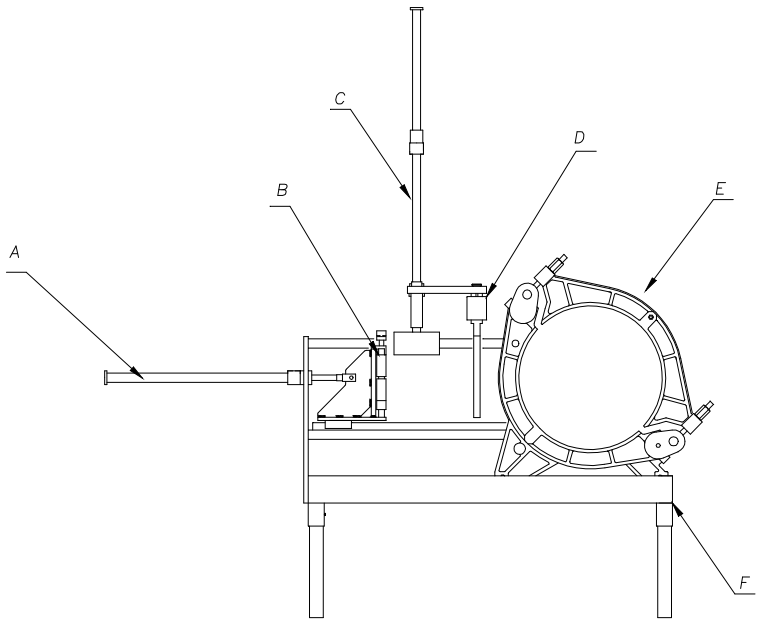
Technical Data

Electric Data		**Hydraulic Data**	
Voltage	230 V	Maximum Working Pressure	110 bar
Frequency	50/60 Hz	Cylinder's Section	7,65 cm2
Total Power	8,4 KW 35 A	Pump's Capacity	3.5 l/min 1000 rpm
Heating Mirror	IP 54 6,48 KW	Hydraulic Oil	ISO 46
Hydraulic Unit	IP 44 1.84 KW	Oil Tank	3 l
Dimensions		**Weight**	
Basic Machine	0,9x1,9x2,6 m	Basic Machine	750 Kg

SDI 630

Hydraulic operated Tees derivation machine (pipe-pipe derated 0.7) suitable for fabrication fo tee derivation range D. 90x315 to 315x630mm.
The machine is supplied complete of:

- Basic Machine including :
  - Frame
  - PTFE coated heating mirror
- Two pipes clamps d. 630 mm
- Light weight reducing rings for the pipe clamps
- Derivations clamp
- Light weight reducing rings for the derivations clamps



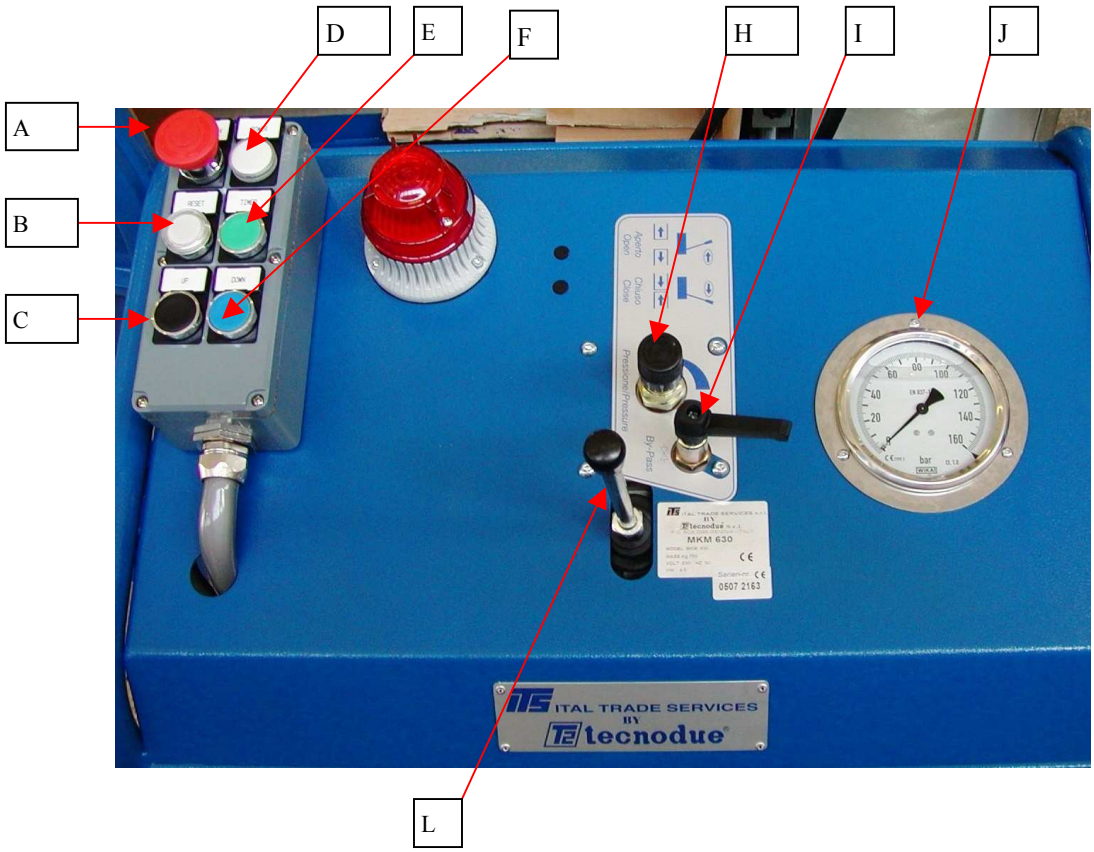
A. derivation clamp cylinder
B. derivation clamp
C. heating mirror cylinder
D. heating mirror
E. pipe clamp
F. frame

a. Machine's Controls Description

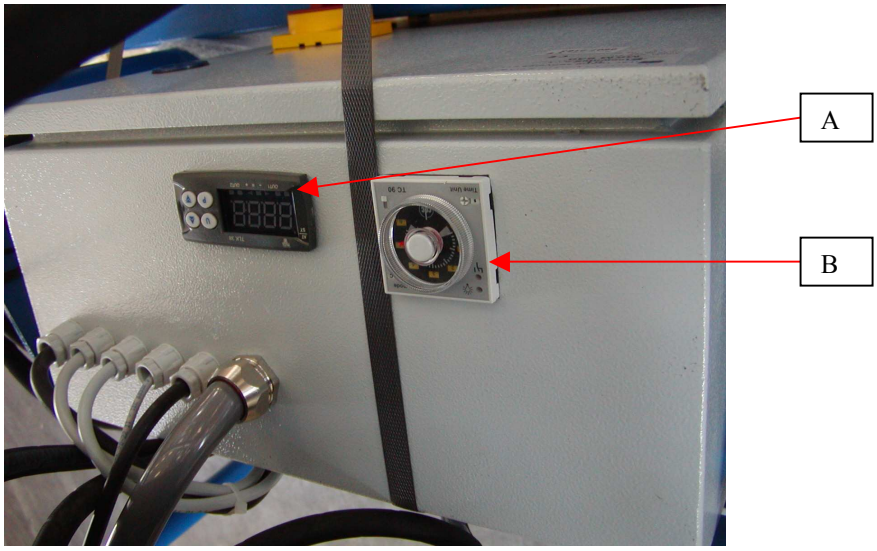
In order to avoid any problems and to achieve the best performances from the machine we suggest you to follow the following installation and operating procedures:

-. Check is the machine is properly positioned on a horizontal plane in the workshop
-. Connect the machine to an electrical board , provided with a main switch accordingly to the electric specification used (220/240V 50Hz is the standard one)
-. After the electric connection , you can go on with the several working operations available with this machine, however it's strongly suggested to get use to all controls and functions located on the front panel (see **Hydraulic and Electric Controls Front Panel** Drawings) as per the following:

a.1 Electric Controls Front Panel



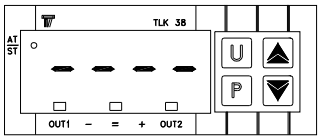
A Emergency push button
B Machine resetting push button
C Black button heating mirror up
D Power light
E Green button timer start
F Blue button heating mirror down
G Blinking light
H Pressure Control Hand wheel
I By pass Lever
J Pressure gauge
L Distributor lever



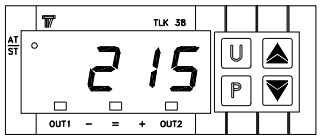
A Thermostat **B** Timer

At each startup on the display will blink the writing **'TEST'.** This means that the thermostat is testing the connection between the probe and the heating mirror.

If the test fails, the display will show 4 blinking upper scores (as per figure aside),
in this case the probe or the connection between the thermostat and the heating
mirror could be interrupted.



If the test success, the display will show the **real temperature of the heating mirror** and the heating mirror warms up (the OUT1 red led is switched on) until the set point value (the selected temperature) has been achieved (central green light led).

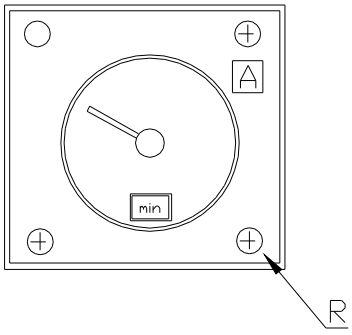


To display the actual set point value of the temperature stored by the thermostat, push the key **P.** The display will show alternately the
writing **'SP1'** and the **set point value of the temperature.** After 5 seconds the display will show again the real value of the heating
mirror temperature

To select a new value for the thermostat set point value **(default value = 220°C):**

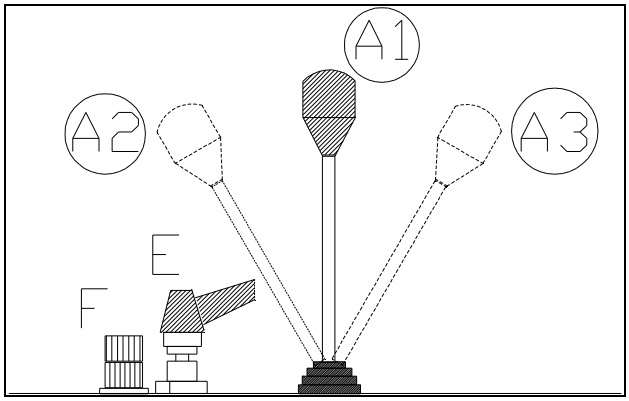
1. Push the key **P** (The display will show alternately the writing **'SP1'** and the **set point value of the temperature**)
2. By acting on the arrow keys UP and DOWN it is possibile to increase or decrease the set point value.
3. When you reach the desired value push the key **P** to confirm.
4. The display will show again the real value of the heating mirror temperature
5. When the heating mirror will reach the set point value on the display the central green light led will be switched on.

**Warning: On the thermostat display is always shown the actual value of the heating mirror temperature (and never the set
point value!)**



-. **The Timer** is utilised in order to set the correct cooling and/or heating time.
By acting on the hole A by means of utilising the supplied yellow pin
it's possible to set up different time ranges according to the need (sec., min., hours) by acting on R hole.
In order to start the timer after the set up of the chosen time , the push button E " timer start " must be pushed according to the timer chosen , the blinking light will go on until the selected time, elapsed this time the timer on-off light will light on.

a.2 Hydraulic Controls Front Panel



The **Control Lever A** opens and closes the machine's trolley according to the selected position.
Bringing the lever **A** into position **(A2)** (position with automatic return) the trolleys are opening with the maximum pressure set up into the hydraulic unit
In central position the lever **A** shut down automatically the engine (release position).
Bringing the lever **A** into position **(A3)** (position with hooking) the trolleys are closing, the hooking of such position allows the operator handling.

-. **The Pressure by Pass Lever E** allows ,by turning anticlockwise the pressure releasing ,while turning it clockwise allows the pressure increasing and fixing.
-. **The Pressure Control Hand wheel F** allows the setting up of the pressure at the requested values.

The **Pressure by Pass Lever (E)** allows ,by turning anticlockwise the pressure releasing , while turning in clockwise allows the pressure increasing and fixing.
At the end run the lever E block and fix the pressure Allowing on the welding cycle the pressure keeping even with engine off
The **Pressure Control Hand wheel (F)** allows the setting up of the pressure at the requested values.
By turning anticlockwise the pressure reduces, while turning it clockwise the pressure increases.

b. Machine's operation

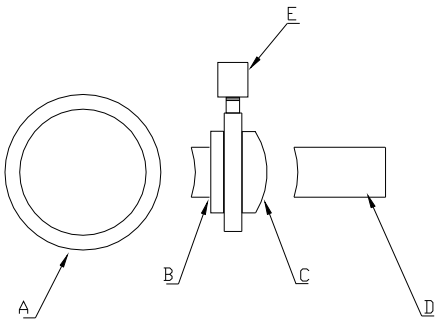
1. Machine's preparation

1a. In case fit the inserts into the pipe clamp of the diameter of the pipe (A) to be welded with the derivation

1b. in case fit the inserts into the derivation clamp of the diameter of the derivation (D) to be welded

1c. Assemble into the heating mirror E the female bushes B corresponding to the derivation to be welded and the male bushes C corresponding to pipe diameter

1d. Clean carefully the bushes and the surfaces to be welded



1e. Connect the plugs to the power supply after checking that the main power supply is within a 10% of the specified one

1f. Connect the plug of the heating mirror to the control board

1g. Connect the flexible hoses of the hydraulic unit to the machine

1h. Turn the main switch

Warning Heating Mirror start to warm up

1i. Select the correct temperature on the heating mirror **(Select a temperature of 220° to obtain a temperature of 210° on the bushes)**

1j. Set up the timer for the heating time.

1k. Before carry on further operation check the temperature on the bushes

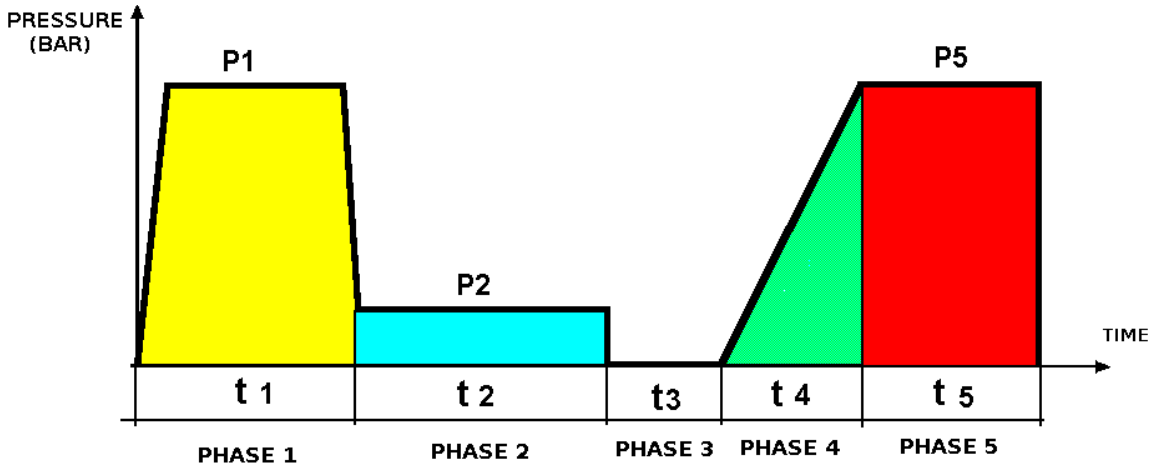
1l. Adjust the position of the derivation into the pipe in order to reach the perfect centring

Welding Cycle

The welding cycle is divided in 5 + 1 different phases :

PHASE 1 : Bead Formation t1
PHASE 2 : Heating up t2
PHASE 3 : Change over t3
PHASE 4 : Bringing up pressure t4
PHASE 5 : Cooling Down under pressure t5

The following graphic shows all the phases:



Pressure-Time diagram for butt welding

t1 = Time requested for the bead formation with the specified wall thickness
t2 = Time requested for the continual heating
t3 = Time requested for the change over
t4 = Time requested for bringing up the pressure
t5 = Time requested for cooling down
P2 = Pressure during the continual heating
P1 = Pressure during the bead formation and the cooling down

1. Bead Formation t1

1a. Lowering the heating mirror by acting the selector taking care that the temperature of the surfaces is the one selected

1b. Bring the lever **A** into position **(A3)** in order to have the bead formation as per attached table, this operation must be done with the true welding pressure value: (Inertial pressure + **P1**).

1c. Check the Bead formation wall thickness according to the attached welding table **3.**

2. Heating up t2

2a. After bead formation act on lever **(F)** anticlockwise in order to bring the pressure to zero and proceed to the heating time at pressure **P2**.

3. Change over t3

3a. Elapsed the heating time at pressure **P2** bring the lever **A** into position **(A2)** and bring up the heating mirror by acting the selector and immediately bring the lever **A** into position **(A3)** and acting on lever **(F)** clockwise put in contact the two pipes

4. Bringing up pressure t4

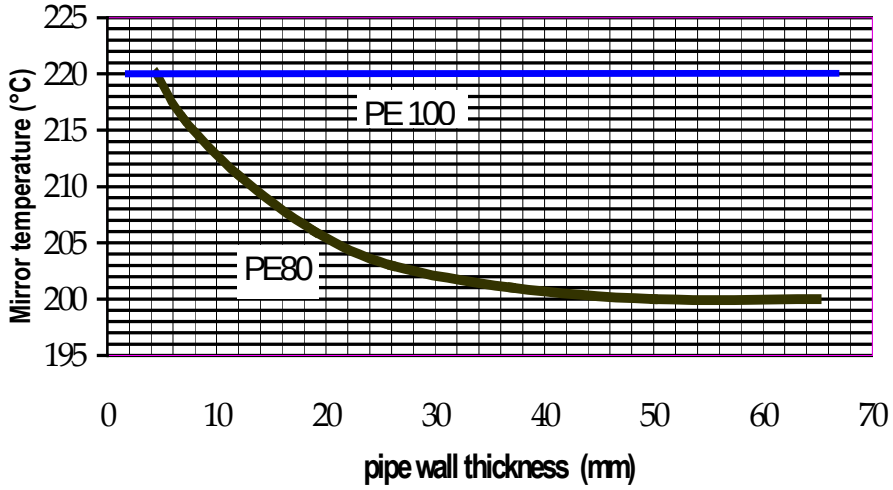
4a. Achieve the true welding pressure value: (Inertial pressure + **P1**) by checking the pressure gauge, This operation must be done according to the time indicated into the attached welding tables.

5-6. Cooling Down t5

5-6a. Bring the lever **A** into central position and keep such situation for all the cooling time indicated into the attached welding table, taking care that the pressure will not decrease too much

5-6b. Elapsed the cooling time by acting on lever **F** anticlockwise bring the pressure to zero.

5-6c. Take away the pipes welded and leave them for the time **t6** indicated on attached welding tables



Remember

When welding **PVDF**, the temperature of the welding mirror should be adjusted for every wall thickness at 240°C +/- 8°C

When welding **PP**, the temperature of the welding mirror should be adjusted for every wall thickness at 210°C +/-10°C

c. Welding Parameters for PE pipes and derivations

The following tables show the values to be applied during the welding cycle as per previous instructions and graph. However in order to clarify once again the meaning of these values please kindly note:

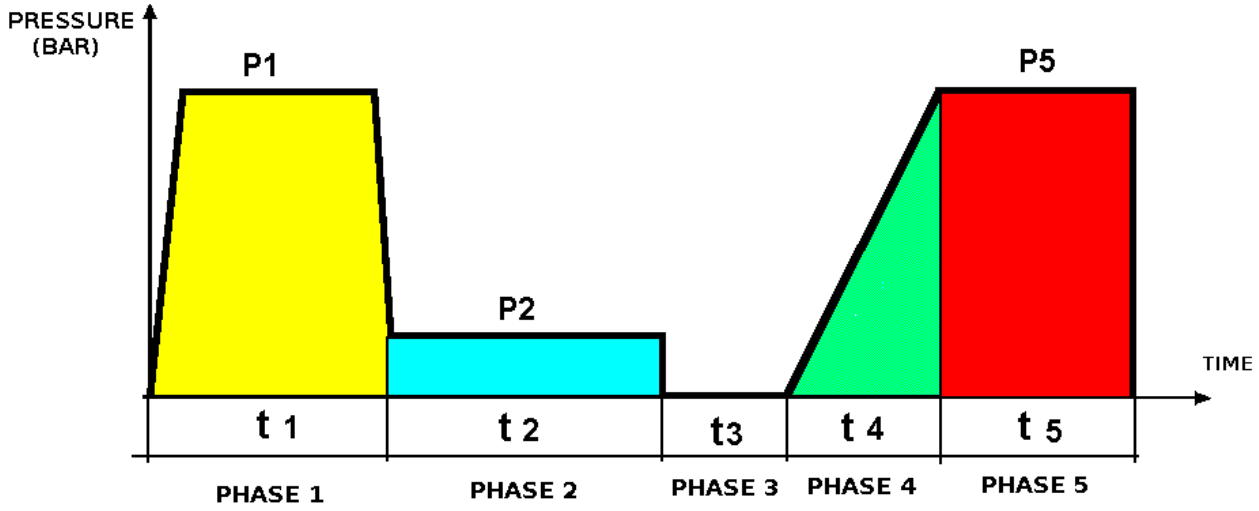
t1 = Time requested for the bead formation to be done with pressure value = **P1** + inertial pressure

t2 = Time requested for the continual heating to be done with pressure value = **P2** + inertial pressure

t3 = Time requested for the change over

t4 = Time requested for bringing up the pressure at the value of pressure = **P1** + inertial pressure

t5 = time requested for cooling down to be done with pressure value = **P1** + inertial pressure



Very important!!!
Please note that the fabricated derivations must with PN de-rated

WELDING TABLES

Machine model SDI 630	Following norm DVS 2207-01
Cylinder section sq. cm.7,65	Material PE
Derivated pipe diameter mm200	

SDR7,4							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	42,6	200	27,0	203	38,0	3,0	0..2,5	270	0..12	14	38,0	33
355	48,0	200	27,0	203	37,1	3,0	0..2,5	270	0..12	14	37,1	33
400	54,1	200	27,0	203	36,4	3,0	0..2,4	270	0..12	14	36,4	33
450	60,8	200	27,0	203	36,0	3,0	0..2,4	270	0..12	14	36,0	33
500	67,6	200	27,0	203	35,7	3,0	0..2,4	270	0..12	14	35,7	33
560	75,7	200	27,0	203	35,4	3,0	0..2,4	270	0..12	14	35,4	33
630	85,1	200	27,0	203	35,2	3,0	0..2,3	270	0..12	14	35,2	33

SDR9							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	35,0	200	22,2	205	32,3	2,5	0..2,2	222	0..11	12	32,3	28
355	39,4	200	22,2	205	31,4	2,5	0..2,1	222	0..11	12	31,4	28
400	44,4	200	22,2	205	30,9	2,5	0..2,1	222	0..11	12	30,9	28
450	50,0	200	22,2	205	30,5	2,5	0..2,0	222	0..11	12	30,5	28
500	55,6	200	22,2	205	30,2	2,5	0..2,0	222	0..11	12	30,2	28
560	62,2	200	22,2	205	30,0	2,5	0..2,0	222	0..11	12	30,0	28
630	70,0	200	22,2	205	29,8	2,5	0..2,0	222	0..11	12	29,8	28

SDR11							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	28,6	200	18,2	207	27,1	2,0	0..1,8	182	0..10	11	27,1	23
355	32,3	200	18,2	207	26,4	2,0	0..1,8	182	0..10	11	26,4	23
400	36,4	200	18,2	207	25,9	2,0	0..1,7	182	0..10	11	25,9	23
450	40,9	200	18,2	207	25,6	2,0	0..1,7	182	0..10	11	25,6	23
500	45,5	200	18,2	207	25,3	2,0	0..1,7	182	0..10	11	25,3	23
560	50,9	200	18,2	207	25,1	2,0	0..1,7	182	0..10	11	25,1	23
630	57,3	200	18,2	207	25,0	2,0	0..1,7	182	0..10	11	25,0	23

SDR13,6							Welding range 315 - 630 mm					
D	**S**	**D**	**S**	**T**	**P1**	**bead**	**P2**	**t 2**	**t 3**	**t 4**	**P5**	**t 5**
MAIN PIPE OD	MAIN PIPE THICKNESS	DERIVATED PIPE OD	DERIVATED PIPE THICKNESS	TEMP.	BEAD FORMATION		HEATING		CHANGEOVER	RAMP	WELDING	
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	23,2	200	14,7	209	22,5	2,0	0..1,5	147	0..9	9	22,5	19
355	26,1	200	14,7	209	21,8	2,0	0..1,5	147	0..9	9	21,8	19
400	29,4	200	14,7	209	21,4	2,0	0..1,4	147	0..9	9	21,4	19
450	33,1	200	14,7	209	21,1	2,0	0..1,4	147	0..9	9	21,1	19
500	36,8	200	14,7	209	20,9	2,0	0..1,4	147	0..9	9	20,9	19
560	41,2	200	14,7	209	20,7	2,0	0..1,4	147	0..9	9	20,7	19
630	46,3	200	14,7	209	20,6	2,0	0..1,4	147	0..9	9	20,6	19

SDR17							Welding range 315 - 630 mm					
D	**S**	**D**	**S**	**T**	**P1**	**bead**	**P2**	**t 2**	**t 3**	**t 4**	**P5**	**t 5**
MAIN PIPE OD	MAIN PIPE THICKNESS	DERIVATED PIPE OD	DERIVATED PIPE THICKNESS	TEMP.	BEAD FORMATION		HEATING		CHANGEOVER	RAMP	WELDING	
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	18,5	200	11,8	211	18,3	1,5	0..1,2	118	0..8	8	18,3	16
355	20,9	200	11,8	211	17,8	1,5	0..1,2	118	0..8	8	17,8	16
400	23,5	200	11,8	211	17,4	1,5	0..1,2	118	0..8	8	17,4	16
450	26,5	200	11,8	211	17,2	1,5	0..1,1	118	0..8	8	17,2	16
500	29,4	200	11,8	211	17,0	1,5	0..1,1	118	0..8	8	17,0	16
560	32,9	200	11,8	211	16,9	1,5	0..1,1	118	0..8	8	16,9	16
630	37,1	200	11,8	211	16,8	1,5	0..1,1	118	0..8	8	16,8	16

REMEMBER:
In case of welding PE100 heating temperature must be 220 °C;
Drag pressure must be added to P1 and P5

Machine model SDI 630	Following norm DVS 2207-01
Cylinder section sq. cm.7,65	Material PE
Derivated pipe diameter mm250	

SDR7,4							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	42,6	250	33,8	202	64,2	3,0	0..4,3	338	0..15	18	64,2	41
355	48,0	250	33,8	202	61,1	3,0	0..4,1	338	0..15	18	61,1	41
400	54,1	250	33,8	202	59,1	3,0	0..3,9	338	0..15	18	59,1	41
450	60,8	250	33,8	202	57,8	3,0	0..3,9	338	0..15	18	57,8	41
500	67,6	250	33,8	202	57,0	3,0	0..3,8	338	0..15	18	57,0	41
560	75,7	250	33,8	202	56,3	3,0	0..3,8	338	0..15	18	56,3	41
630	85,1	250	33,8	202	55,7	3,0	0..3,7	338	0..15	18	55,7	41

SDR9							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	35,0	250	27,8	203	54,8	3,0	0..3,7	278	0..13	15	54,8	34
355	39,4	250	27,8	203	52,0	3,0	0..3,5	278	0..13	15	52,0	34
400	44,4	250	27,8	203	50,2	3,0	0..3,3	278	0..13	15	50,2	34
450	50,0	250	27,8	203	49,0	3,0	0..3,3	278	0..13	15	49,0	34
500	55,6	250	27,8	203	48,3	3,0	0..3,2	278	0..13	15	48,3	34
560	62,2	250	27,8	203	47,7	3,0	0..3,2	278	0..13	15	47,7	34
630	70,0	250	27,8	203	47,2	3,0	0..3,1	278	0..13	15	47,2	34

SDR11							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	28,6	250	22,7	204	46,4	2,5	0..3,1	227	0..11	13	46,4	28
355	32,3	250	22,7	204	43,8	2,5	0..2,9	227	0..11	13	43,8	28
400	36,4	250	22,7	204	42,2	2,5	0..2,8	227	0..11	13	42,2	28
450	40,9	250	22,7	204	41,2	2,5	0..2,7	227	0..11	13	41,2	28
500	45,5	250	22,7	204	40,5	2,5	0..2,7	227	0..11	13	40,5	28
560	50,9	250	22,7	204	40,0	2,5	0..2,7	227	0..11	13	40,0	28
630	57,3	250	22,7	204	39,5	2,5	0..2,6	227	0..11	13	39,5	28

SDR13,6							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	23,2	250	18,4	206	38,6	2,0	0..2,6	184	0..10	11	38,6	23
355	26,1	250	18,4	206	36,3	2,0	0..2,4	184	0..10	11	36,3	23
400	29,4	250	18,4	206	34,9	2,0	0..2,3	184	0..10	11	34,9	23
450	33,1	250	18,4	206	34,0	2,0	0..2,3	184	0..10	11	34,0	23
500	36,8	250	18,4	206	33,4	2,0	0..2,2	184	0..10	11	33,4	23
560	41,2	250	18,4	206	33,0	2,0	0..2,2	184	0..10	11	33,0	23
630	46,3	250	18,4	206	32,6	2,0	0..2,2	184	0..10	11	32,6	23

SDR17							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	18,5	250	14,7	209	31,6	2,0	0..2,1	147	0..9	9	31,6	19
355	20,9	250	14,7	209	29,7	2,0	0..2,0	147	0..9	9	29,7	19
400	23,5	250	14,7	209	28,5	2,0	0..1,9	147	0..9	9	28,5	19
450	26,5	250	14,7	209	27,7	2,0	0..1,8	147	0..9	9	27,7	19
500	29,4	250	14,7	209	27,2	2,0	0..1,8	147	0..9	9	27,2	19
560	32,9	250	14,7	209	26,9	2,0	0..1,8	147	0..9	9	26,9	19
630	37,1	250	14,7	209	26,6	2,0	0..1,8	147	0..9	9	26,6	19

REMEMBER:
In case of welding PE100 heating temperature must be 220 °C;
Drag pressure must be added to P1 and P5

Machine model SDI 630	Following norm DVS 2207-01
Cylinder section sq. cm.7,65	Material PE
Derivated pipe diameter mm315	

SDR7,4							Welding range 400 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
400	54,1	315	42,6	201	101,5	3,5	0..6,8	426	0..18	22	101,5	51
450	60,8	315	42,6	201	96,8	3,5	0..6,5	426	0..18	22	96,8	51
500	67,6	315	42,6	201	94,0	3,5	0..6,3	426	0..18	22	94,0	51
560	75,7	315	42,6	201	91,9	3,5	0..6,1	426	0..18	22	91,9	51
630	85,1	315	42,6	201	90,4	3,5	0..6,0	426	0..18	22	90,4	51

SDR9							Welding range 355 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
355	39,4	315	35,0	201	95,0	3,0	0..6,3	350	0..15	18	95,0	43
400	44,4	315	35,0	201	86,7	3,0	0..5,8	350	0..15	18	86,7	43
450	50,0	315	35,0	201	82,3	3,0	0..5,5	350	0..15	18	82,3	43
500	55,6	315	35,0	201	79,9	3,0	0..5,3	350	0..15	18	79,9	43
560	62,2	315	35,0	201	78,0	3,0	0..5,2	350	0..15	18	78,0	43
630	70,0	315	35,0	201	76,6	3,0	0..5,1	350	0..15	18	76,6	43

SDR11							Welding range 355- 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
355	32,3	315	28,6	203	80,9	3,0	0..5,4	286	0..13	15	80,9	35
400	36,4	315	28,6	203	73,3	3,0	0..4,9	286	0..13	15	73,3	35
450	40,9	315	28,6	203	69,3	3,0	0..4,6	286	0..13	15	69,3	35
500	45,5	315	28,6	203	67,1	3,0	0..4,5	286	0..13	15	67,1	35
560	50,9	315	28,6	203	65,5	3,0	0..4,4	286	0..13	15	65,5	35
630	57,3	315	28,6	203	64,3	3,0	0..4,3	286	0..13	15	64,3	35

SDR13,6							Welding range 315 - 630 mm					
D MAIN PIPE OD	**S** MAIN PIPE THICKNESS	**D** DERIVATED PIPE OD	**S** DERIVATED PIPE THICKNESS	**T** TEMP.	**P1** BEAD FORMATION	**bead**	**P2** HEATING	**t 2**	**t 3** CHANGEOVER	**t 4** RAMP	**P5** WELDING	**t 5**
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	23,2	315	23,2	204	106,3	2,5	0..7,1	232	0..11	13	106,3	29
355	26,1	315	23,2	204	67,8	2,5	0..4,5	232	0..11	13	67,8	29
400	29,4	315	23,2	204	61,0	2,5	0..4,1	232	0..11	13	61,0	29
450	33,1	315	23,2	204	57,5	2,5	0..3,8	232	0..11	13	57,5	29
500	36,8	315	23,2	204	55,6	2,5	0..3,7	232	0..11	13	55,6	29
560	41,2	315	23,2	204	54,1	2,5	0..3,6	232	0..11	13	54,1	29
630	46,3	315	23,2	204	53,1	2,5	0..3,5	232	0..11	13	53,1	29

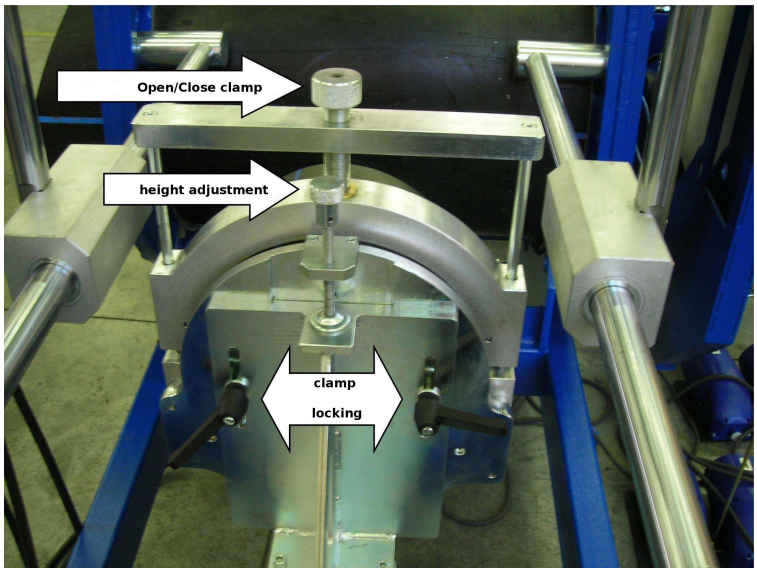
SDR17							Welding range 315 - 630 mm					
D	**S**	**D**	**S**	**T**	**P1**	**bead**	**P2**	**t 2**	**t 3**	**t 4**	**P5**	**t 5**
MAIN PIPE OD	MAIN PIPE THICKNESS	DERIVATED PIPE OD	DERIVATED PIPE THICKNESS	TEMP.	BEAD FORMATION		HEATING		CHANGEOVER	RAMP	WELDING	
mm	mm	mm	mm	℃	bar	mm	bar	sec	sec	sec	bar	min
315	18,5	315	18,5	206	92,8	2,0	0..6,2	185	0..10	11	92,8	23
355	20,9	315	18,5	206	56,0	2,0	0..3,7	185	0..10	11	56,0	23
400	23,5	315	18,5	206	50,0	2,0	0..3,3	185	0..10	11	50,0	23
450	26,5	315	18,5	206	47,0	2,0	0..3,1	185	0..10	11	47,0	23
500	29,4	315	18,5	206	45,3	2,0	0..3,0	185	0..10	11	45,3	23
560	32,9	315	18,5	206	44,1	2,0	0..2,9	185	0..10	11	44,1	23
630	37,1	315	18,5	206	43,2	2,0	0..2,9	185	0..10	11	43,2	23

REMEMBER:
In case of welding PE100 heating temperature must be 220 °C;
Drag pressure must be added to P1 and P5

d. Adjustments & Regulations

Before starting any welding operations and maintaining the heating mirror cool it's necessary to carry out the following operations:

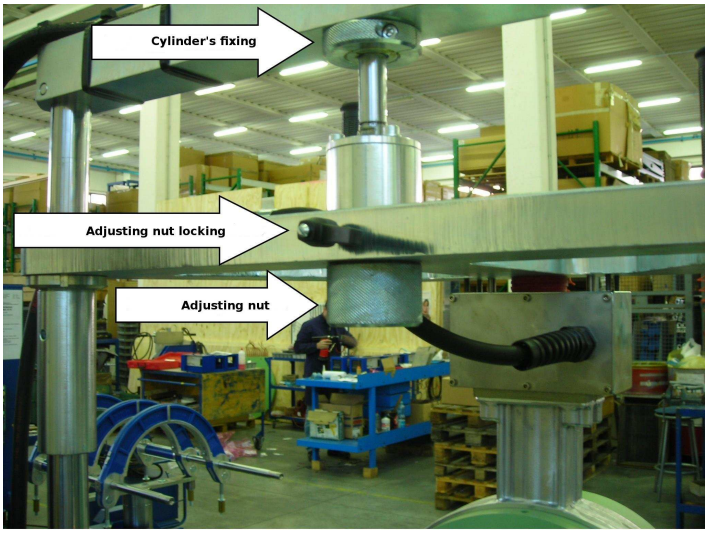
Vertical Adjustment of Derivation Clamp



- Insert the derivated pipe into the clamp
- Close the clamp by acting on the Open/Close handwheel
- Loosen the clamp lockings
- Adjust the height of the clamp by acting on the handwheel shown in picture (you can achieve this operation by bringing in contact the derivated pipe with the main pipe at the welding pressure)
- Tighten the clamp lockings

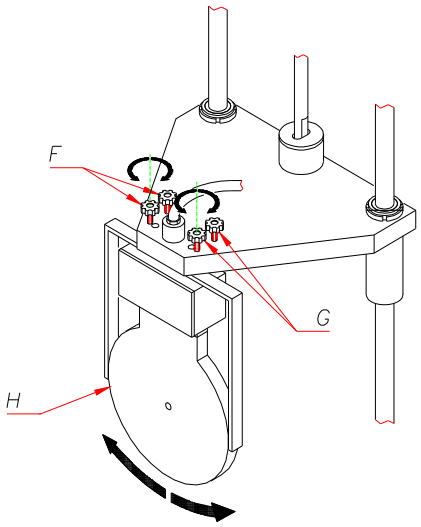
Vertical Adjustment of the Heating Mirror

- Assemble the bushes on heating mirror
- Insert the derivated pipe into the clamp
- Take down the heating mirror
- Bring the bushes in contact with the derivated pipe and main pipe
- If necessary proceed to the adjustment of the heating mirror vertical position by means of releasing the adjusting nut locking and by acting on the adjusting nut
- After the adjustment have been done tighten again the adjusting nut locking lever



To easily transport the machine you can remove the vertical cylinder by loosening the cylinder's fixing metal ring shown by the picture.

Pendular Adjustment of the Heating Mirror



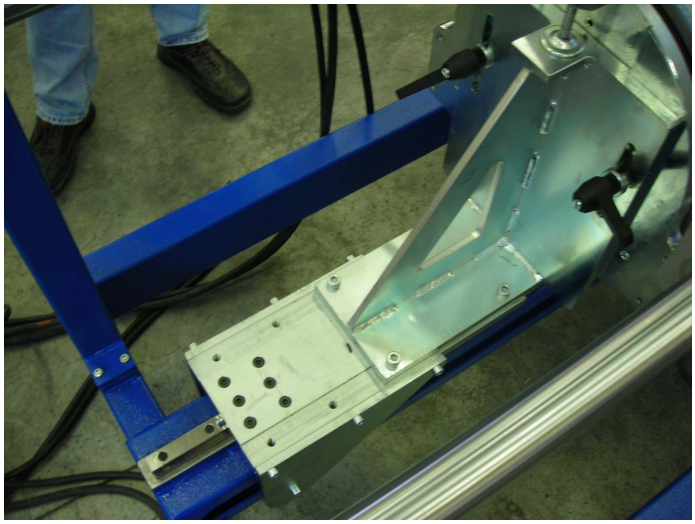
- If necessary carry out the heating mirror pendular adjustment by means of acting on hand wheels F and G

- **The first regulation has to be carried on , every time a welding must be done**

- **The second and third regulations must be carried on , only when the PTFE coated bushes must be changed**

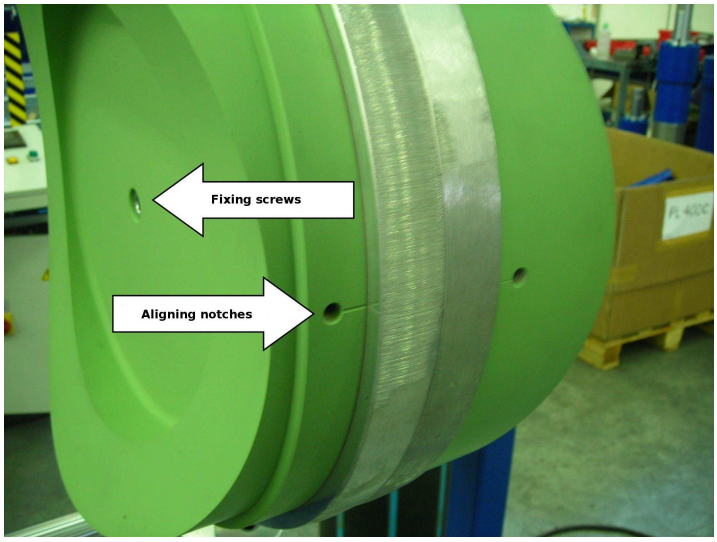
Positions of the derivated pipe clamp

- You can fix the derivated pipe clamps in three different positions, to permit the welding of segments of different dimensions



Alingment and assembly of the bushes

- On the heating mirror and on the bushes there are some aligning notches to place and correctly align the bushes
- To chanche and align the bushes act on the fixing screws shown by the picture.



e. Maintenance

Basic Machine

It's strongly suggested to keep always the machine clean with particular care of the bolts and the cylinder's heads . Periodically grease the cylinder's stem.

Heating element & Bushes

Please take care on handling the heating mirror and the bushes in order to avoid damages to the PTFE coating.
Keep always clean the PTFE coated surfaces, cleaning must be done with surface still warm by using a soft cloth or paper, avoiding abrasive materials in that might damage the PTFE coated surfaces.
At regular intervals we suggest you to:

- Clean the surfaces by a quick evaporation detergent (alcohol)
- Check the tightening of the screws and the cable and plug condition

Hydraulic Unit

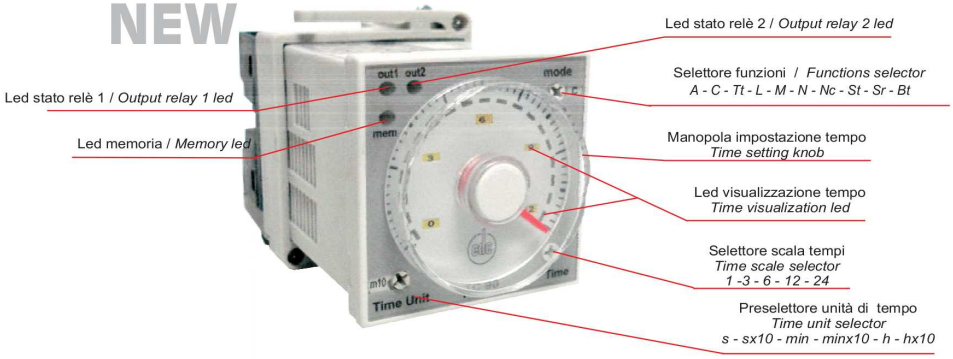
The hydraulic unit does not need particular maintenance nevertheless the following instructions must be followed:

1. Check periodically the oil level and in case add with oil type:
   ESSO Nuto H 68,SHELL Tellus 68,MOBIL DTE 26,AGIP OSO 46
   The level should not be lower than 5 cm from the tank maximum level.
   A checking every 15 working days it's strongly suggested.
2. Replace totally the oil every 6 months or after 500 working hours.
3. Keep clean the hydraulic unit with particular care on the tank and quick couplings.

Appendix A: Timer instructions

TC 90 NEW

MULTISCALA, MULTITENSIONE, MULTIFUNZIONE. Dimensioni 48x48mm
MULTIRANGE, MULTIVOLTAGE, MULTIFUNCTION. *Dimensions 48x48mm*



Timer elettronico digitale con impostazione analogica e lettura diretta del tempo trascorso e residuo su scala retroilluminata e su barra di led.
Tramite i selettori rotativi presenti sul frontale si possono scegliere:
-Una tra le 10 funzioni disponibili.
-Uno dei 30 tempi di fondo scala disponibili.
Inoltre tramite la manopola si può impostare in modo preciso il tempo selezionato.
Tramite i minidip presenti sul lato dello strumento è possibile impostare
A) il funzionamento del relè AR1(istantaneo o con funzionamento uguale a AR2)
B) abilitare la memoria (attiva solo durante il conteggio).
I led I frontali segnalano l'attivazione della memoria e lo stato dei relè. Zoccolato Octal può essere montato da pannello (zoccolo AZ58) e da retro quadro (zoccolo AZ68 e clips AZ81)

Digital timer with analogue setting and direct reading of the past and residual time through leds bar and backlight scale.
Through the rotary selectors on the front it is possible to select:
- one from available 10 functions.
- one from available 30 full scale time.
Through the knob it is possible to set in a precise mode the wanted time.
Through the minidips on the side it is possible to set :
A) The working mode of the relay AR1 (istantaneous or with the same function of relay AR2).
B) Memory ON or OFF (the memory is active only during the counting).
The leds on the front point out the presence of the memory and the relays state. With Octal socket , *it can be mounted on panel (with socket AZ58) and wall (with socket AZ68 and retainer clips AZ81).*

Dati Tecnici *Technical data*
Potenza assorbita *Input power* **2.5W a 24Vdc 11VA a 230Vac**
Precisione di fondo scala *Full scale error* +/- 1%
Impostazione minima *Minimum time setting* Fun. A-C-N-Nc-St-Sr-Bt: **0** Fun. Tt-L-M: **1/50 f.s.**
Tempo minimo di reset sull'alimentazione *Minimum reset time on power supply* 0.2 s
Limiti di temperatura *Temperature ranges* **Impiego** *Operating* -10 ÷ +50 °C **Con memoria** *With memory* 0 -- +50 °C **Stoccaggio** *Storage* -25 ÷ +65 °C
Caratteristiche dei relè *Relay technical data*
Vita elettrica *Electrical life* **$5x10^5$ op.**
Vita meccanica *Mechanical life* **$1x10^7$ op.**
Corrente max commutabile Maximum *current rating* **6A - AC1**
Tensione max commutabile Maximum voltage *rating* **250 Vac**
OMOLOGAZIONI / ***STANDARDS*** CE

Caratteristiche

Tensioni disponibili : 24..... 230 Vac-dc

Tempi fondoscala impostabili :
1 - 3 - 6 -12 - 24 sec + secx10 + min + minx10 + h + hx10

Funzioni impostabili :
A + C + L + M + N + Nc +Tt + Bt + St + Sr
Nelle funzioni A,C,L,M,N,Nc,Tt,Bt è possibile avere la memoria (che è attiva solo durante il conteggio).
La memoria può essere abilitata in ogni momento del ciclo.
La memoria deve essere disabilitata a timer alimentato.

Features

Supply voltage : 24..... 230 Vac-dc

Full scale time setting :
1 - 3 - 6 -12 - 24 sec + secx10 + min + minx10 + h + hx10

Functions setting :
A + C + L + M + N + Nc +Tt + Bt + St + Sr
In the functions A , C , L , M , N , Nc ,Tt , Bt is possible to have the memory (the memory works only during the counting).
The memory could set in every moments of the cycle.
It is possible to go out of the memory option only with the supply voltage connected.

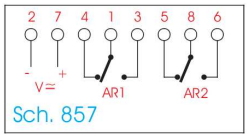
Impostazioni MINIDIPS *Settings*

Funzioni *Functions*	**A - C - L - M - N - Nc**	**Relè AR1** *Relay AR1*	 **AR1: IST.**	 **AR1: Segue l'andamento di AR2** ***Follows the AR2 turning ON***	 **Memoria ON** ***Memory ON***	 **Memoria OFF** ***Memory OFF***
Funzione *Function*	**Tt**	**Ritardo tra i tempi ON e OFF** ***ON/OFF times delay***	 **0.7 s**	 **0 s**	 **Memoria ON** ***Memory ON***	 **Memoria OFF** ***Memory OFF***
Funzione *Function*	**Bt**	**Ritardo all'eccitazione tra AR1-AR2 (% del tempo impostato)** ***AR1-AR2 turning Delay-ON (% set time)***	 **1/25**	 **1/50**	 **Memoria ON** ***Memory ON***	 **Memoria OFF** ***Memory OFF***
Funzioni *Functions*	**St - Sr**	**Ritardo tra i tempi ⅄ e Δ** ***⅄ / Δ times delay***	 **50 ms**	 **100 ms**	 **250 ms**	 **500 ms**

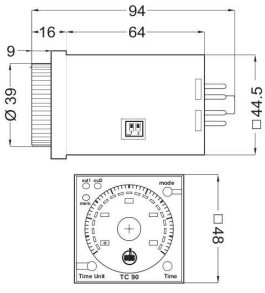
Codice / *Order code*

24....230Vac-dc TC90-57-00-00-70-0

Schema collegamento *Wiring diagram*



Dimensioni / *Dimensioni (mm)*



Appendix B: Assembly of the heating mirror support

- Lift the heating mirror support by using a rope and forklift and place it next to the guides

- Fix the support on the holes shown in picture by the supplied screws. Keep the maximum attention to completely tighten the fixing screws.

- Assemble bushes on heating mirror and proceed with all adjustment as per chapter d. (page no. 18)

This manual has been printed on March 2011