

I.T.S. by Tecnodue

SDI 315

Operating Manual

This manual includes technical information only.

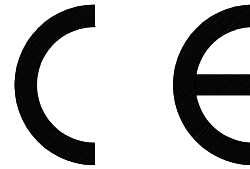
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SDI 315

This workshop hydraulic operated machine has been designed and constructed in order to allow the 90° side welding of branch pipes into main pipes in PE and PP

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SDI 315

Range: See the table below indicating the available bushes

VOLT	230
HZ	50
KW	2.1
A	10

Bushes (main pipe/branch pipe)

90 160	110 160	125 160	160 200
90 180	110 180	125 180	160 225
90 200	110 200	125 200	160 250
90 225	110 225	125 225	160 280
90 250	110 250	125 250	160 315
90 280	110 280	125 280	
90 315	110 315	125 315	

SAFETY RULES ACCORDING TO DIRECTIVE CEE

(To be read carefully and apply while utilizing the SDI 315)

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 utilized, adjusted and keep in the perfect functioning conditions by skill operators.

Warning - Rules - Obligations

1.Transport

The machine, weight Kg.295 therefore, keep the maximum care while moving it , utilizing mechanical aids.

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 utilize the machine in case of rain or in wheat conditions or even close to flammable liquids.

4.Clothes

Keep the maximum care while utilizing 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 utilizing 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 utilizing the facing tool. Be careful to the blades , it's strongly suggested to use suitable gloves.

Avoid utilizing 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 utilize 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

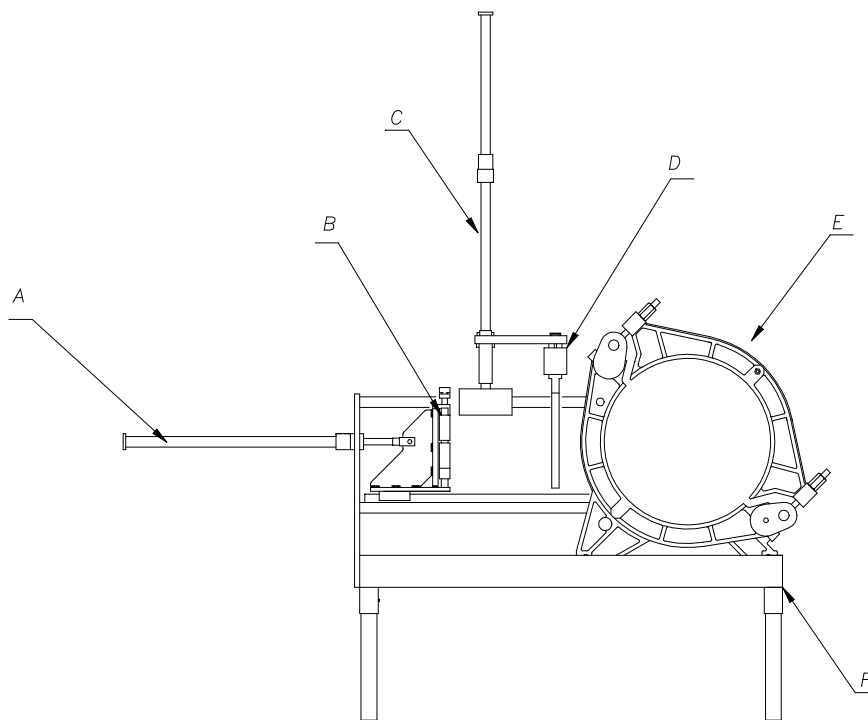
Electric Data	
Voltage	230 V
Frequency	50 Hz
Total Power Installed	2.0 KW 10A
Heating Mirror	IP 54 1,30 KW
Hydraulic Unit	IP 44 0.75 KW
Hydraulic Data	
Maximum Working Pressure	100 bar
Cylinder's Section	4,9 sq.cm.
Pump's Capacity	2.5 l/min 1000 rpm
Hydraulic Oil	ISO 46
Oil Tank	5 l
Dimensions	
Basic Machine	1,22x1,05x1,3 m
Weight	
Basic Machine	295 Kg

SDI 315

Workshop hydraulic operated machine suitable for the° side welding of branch pipes from 63 mm upto 160 mm into main pipes in PE and PP from diameter 90 mm up to 315 mm.

The machine is supplied complete of:

- Basic Machine including :
 - Frame
 - PTFE coated heating mirror
- Two pipes clamps d. 315 mm
- Light weight reducing rings for the pipe clamps dia. 90, 110, 125,140, 160, 200, 225, 250, 280 mm
- Fittings clamp d. 160 mm
- Light weight reducing rings for the fittings clamps dia.63,75,90,110,125,140 mm



A fitting clamp cylinder
B fitting 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).

a.1 Electric Controls Front Panel



- Emergency push button
- Power light
- Machine resetting push button
- Green button timer start
- Black button heating mirror down
- Blue button heating mirror up



- a. Pressure control handwheel Thermostat
- b. Distributor lever
- c. By pass lever
- d. Pressure gauge

a b c d



- a. Timer
- b. Thermostat
- c. Main switch
- d. Heating mirror plug

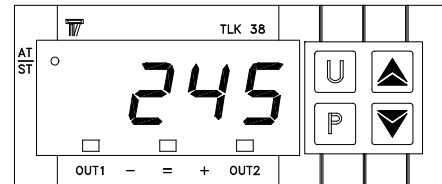
a b c d

-.The Thermostat

When you switch on the machine the thermostat check for some seconds the real temperature and shown it on the display. To show the preset temperatures push the **P** key, after some seconds the display will show again the real temperature of the heating mirror.

In order to select the necessary temperature, please follow these easy steps:

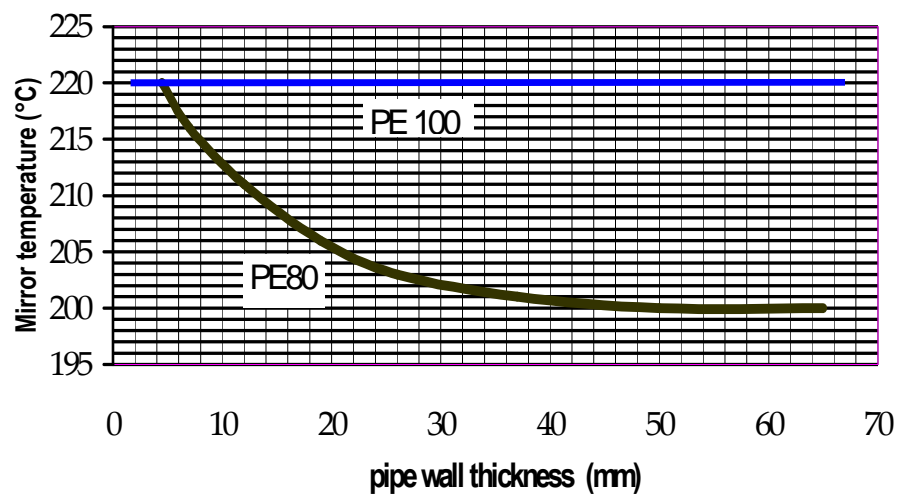
- a. Push the **P** key
- b. Select the new temperature by pushing the arrow keys
- c. Push again the **P** key to fix the new temperature



When the heating mirror reach the selected temperature on the display you will see a green led lighted on.

The above values are also depending on pipe's wall thickness , therefore for accurate temperature setting up we suggest to check the enclosed graphic:

Temperature of the welding mirror for welding PE DVS 2207-1 norm



Remember

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

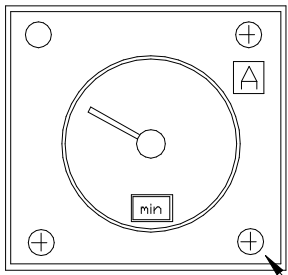
When welding PP, the temperature of the welding mirror should be adjusted for every wall thickness at 210°C +/-10°C

Important !!!

The heating mirror 's temperature during the working operations is always above 200 °C, therefore keep attention and utilize if possible protective gloves in order to avoid burns.

Before proceeding to the first welding wait until the lights has been switched on and off three times, this allows the stabilization of the temperature on the heating mirror surface.

-The Timer

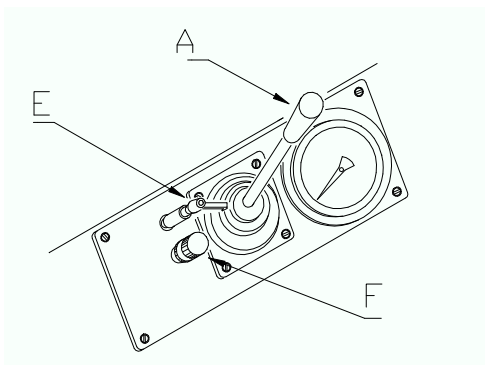


The timer is utilized in order to set the correct cooling and/or heating time.

By acting on the hole A by means of utilizing 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 6 " timer resetting " 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

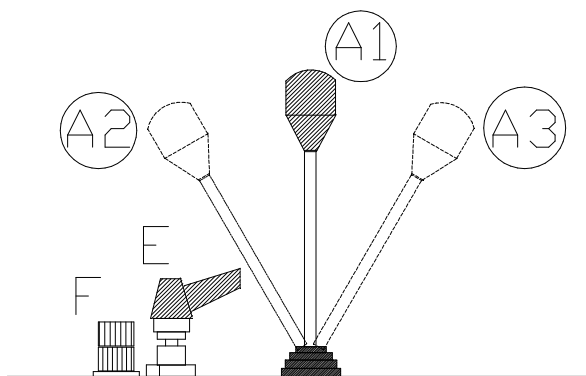


The **Control Lever A** opens and closes the machine's trolley according to the selected position.

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 Handwheel 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 Handwheel (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.

a.3 How to use the hydraulic unit - example

In order to make easy the learning we shall proceed to the description step by step of all operations need in order to complete a welding according to the following description:

Important !

Before begin the following operation be sure that:

- The lever **A** is fixed into the special housing
 - Substitute the metal plug with the plastic black and red plug the plastic plug is supplied with the machine into a plastic bag.
- 01.** Fit the two pipes to be weld (see relative instructions)
 - 02.** By turning the lever **E** anticlockwise bring the pressure to zero, checking the pressure gauge **D**
 - 03.** Turn clockwise the lever **E** until closing (please avoid using an excessive strength)
 - 04.** Bring the lever **A** into position **A3**
 - 05.** By turning clockwise the hand wheel **F** achieve the inertial pressure value (value of pressure need in order to allow the trolley moving) note the value of inertial pressure read into the pressure gauge **D**, then by still operating the hand wheel **F**, increase the inertial pressure value by the welding theoretical pressure value as per attached table.
 - 06.** Achieved the true welding pressure value (inertial pressure plus theoretical welding pressure) bring the lever **A** into position **A2**.
 - 07.** Fit the facing tool (see relative instructions)
 - 08.** By acting on lever **E** anticlockwise achieve a pressure value of approx 5 bar more than the inertial pressure value checked and then proceed to the facing tool operation (taking care that the engine's overloading).
 - 09.** At the end of the facing operation bring the lever **A** into position **A3** and remove the facing tool.
 - 10.** Fit the heating mirror taking care that the temperature of the surfaces is the one selected (see relative instructions)
 - 11.** Bring the lever **A** into **A3** in order to have the bead formation as per attached table, this operation must be done with the true welding pressure value.
 - 12.** After bead formation act on lever **E** anticlockwise in order to bring the pressure to zero and proceed to the heating time as per attached table.
 - 13.** Elapsed the heating time at pressure zero bring the lever **A** into position **A2** and remove the heating mirror and immediately bring the lever **A** into position **A3** and acting on lever **E** clockwise put in contact the two pipes until achieving the true welding pressure value by checking the pressure gauge **D**. These operations must be done according to the time indicated into the attached table.
 - 14.** Bring the lever **A** into position **A1** and keep such situation for all the cooling time indicated into the attached table, taking care that the pressure will not decrease too much, in case bring for a little while the lever **A** into position **A3** and put back into position **A1**
 - 15.** Elapsed the cooling time by acting on lever **E** anticlockwise bring the pressure to zero.
 - 16.** Take away the pipes welded

WE STRONGLY SUGGEST TO TRY MANY TIMES AND GET FAMILIAR TO THE UNIT BEFORE CARRYING ON WITH COMPLETE WELDING.

A WRONG USE OF THE HYDRAULIC UNIT COULD COMPROMISE YOUR WELDINGS.

a.4 Heating mirror disconnecting device

The machine is supplied with a heating mirror disconnecting device.

We adjusted the device as per our common bushes.

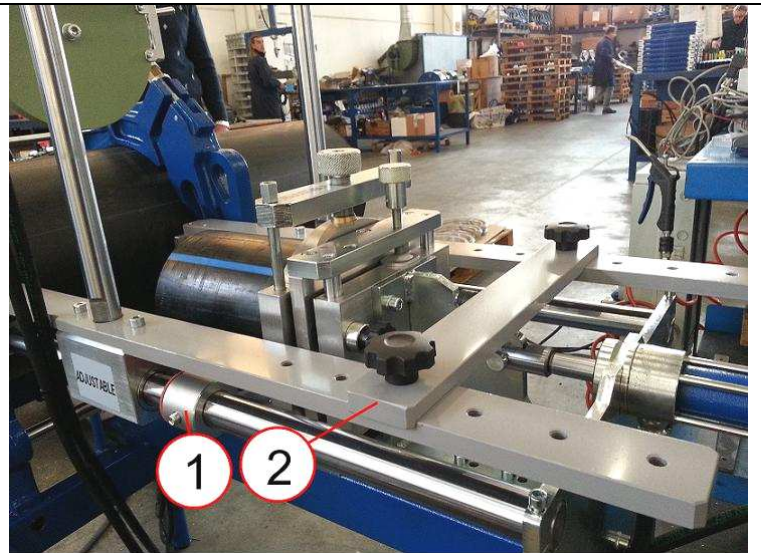
- 1 – Left and right bushings
- 2 - Back bar

In any case you can adjust the device in case of use of special tools.

Warning!

Before using the heating mirror disconnecting device in different positions, move slowly the trolley and check that all is working correctly.

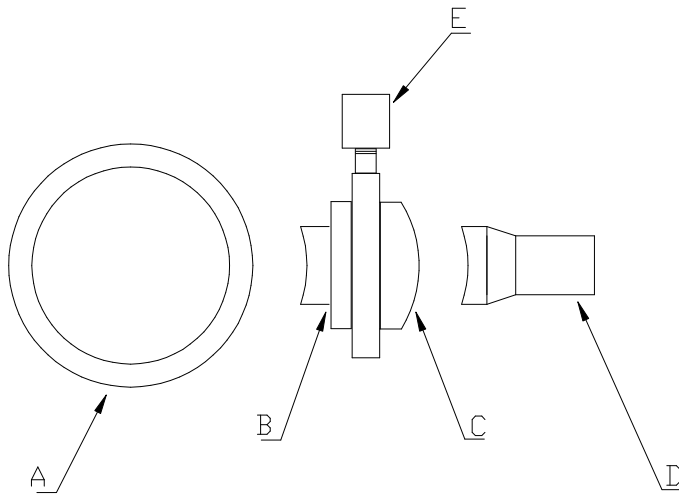
The bushes 1 must maintain the same position.



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 fitting
- 1b. in case fit the inserts into the fitting clamp of the diameter of the fitting (D) to be welded
- 1c. Assemble into the heating mirror E the female bushes B corresponding to the fitting 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
- 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 fitting into the pipe in order to reach the perfect centering

Welding Cycle

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

PHASE 1 : Bead Formation t_1

PHASE 2 : Heating up t_2

PHASE 3 : Change over t_3

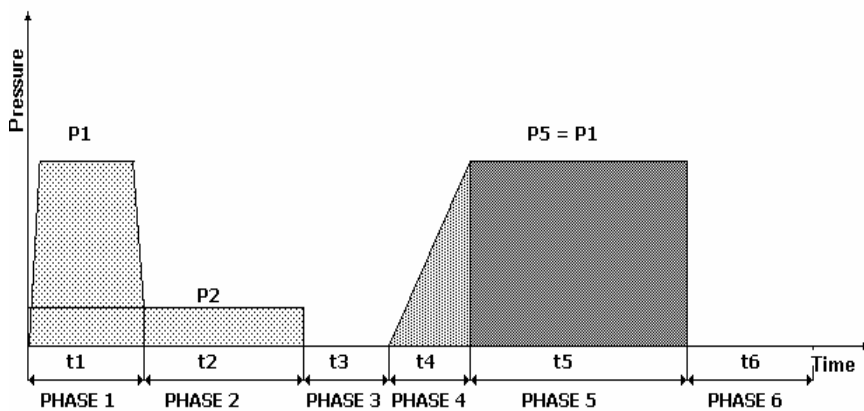
PHASE 4 : Bringing up pressure t_4

PHASE 5 : Cooling Down under pressure t_5

PHASE 6 : Cooling Down out of the machine t_6

The following graphic shows all the phases:

Pressure-Time diagram for butt welding



t_1 = Time requested for the bead formation with the specified wall thickness

t_2 = Time requested for the continual heating

t_3 = Time requested for the change over

t_4 = Time requested for bringing up the pressure

t_5 = Time requested for cooling down

P_2 = Pressure during the continual heating

P_1 = Pressure during the bead formation and the cooling down

2. Bead Formation t1

- 2a. Lowering the heating mirror by acting the selector taking care that the temperature of the surfaces is the one selected
- 2b. 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**).
- 2c. Check the Bead formation wall thickness according to the attached welding table

3. Heating up t2

- 3a. 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**.

4. Change over t3

- 4a. 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

5. Bringing up pressure t4

- 5a. 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.

6. Cooling Down t5

- 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
- 6b. Elapsed the cooling time by acting on lever **F** anticlockwise bring the pressure to zero.
- 6c. Take away the pipes welded and leave them for the time **t6** indicated on attached welding tables

c. Welding Parameters for PE pipes and fittings

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

SDR					7,4		Welding range 110 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
110	14,9	63	8,5	214	5,7	1,5	0.. 0,4	85	0.. 7	7	5,7	12	
125	16,9	63	8,5	214	5,6	1,5	0.. 0,4	85	0.. 7	7	5,6	12	
140	18,9	63	8,5	214	5,6	1,5	0.. 0,4	85	0.. 7	7	5,6	12	
160	21,6	63	8,5	214	5,5	1,5	0.. 0,4	85	0.. 7	7	5,5	12	
180	24,3	63	8,5	214	5,5	1,5	0.. 0,4	85	0.. 7	7	5,5	12	
200	27,0	63	8,5	214	5,4	1,5	0.. 0,4	85	0.. 7	7	5,4	12	
225	30,4	63	8,5	214	5,4	1,5	0.. 0,4	85	0.. 7	7	5,4	12	
250	33,8	63	8,5	214	5,4	1,5	0.. 0,4	85	0.. 7	7	5,4	12	
280	37,8	63	8,5	214	5,4	1,5	0.. 0,4	85	0.. 7	7	5,4	12	
315	42,6	63	8,5	214	5,4	1,5	0.. 0,4	85	0.. 7	7	5,4	12	

SDR					9		Welding range 110 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
110	12,2	63	7,0	216	4,9	1,0	0.. 0,3	70	0.. 6	6	4,9	10	
125	13,9	63	7,0	216	4,8	1,0	0.. 0,3	70	0.. 6	6	4,8	10	
140	15,6	63	7,0	216	4,7	1,0	0.. 0,3	70	0.. 6	6	4,7	10	
160	17,8	63	7,0	216	4,7	1,0	0.. 0,3	70	0.. 6	6	4,7	10	
180	20,0	63	7,0	216	4,6	1,0	0.. 0,3	70	0.. 6	6	4,6	10	
200	22,2	63	7,0	216	4,6	1,0	0.. 0,3	70	0.. 6	6	4,6	10	
225	25,0	63	7,0	216	4,6	1,0	0.. 0,3	70	0.. 6	6	4,6	10	
250	27,8	63	7,0	216	4,6	1,0	0.. 0,3	70	0.. 6	6	4,6	10	
280	31,1	63	7,0	216	4,6	1,0	0.. 0,3	70	0.. 6	6	4,6	10	
315	35,0	63	7,0	216	4,5	1,0	0.. 0,3	70	0.. 6	6	4,5	10	

SDR					11		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
110	10,0	63	5,7	218	4,1	1,0	0.. 0,3	57	0.. 5	5	4,1	8
125	11,4	63	5,7	218	4,0	1,0	0.. 0,3	57	0.. 5	5	4,0	8
140	12,7	63	5,7	218	4,0	1,0	0.. 0,3	57	0.. 5	5	4,0	8
160	14,5	63	5,7	218	3,9	1,0	0.. 0,3	57	0.. 5	5	3,9	8
180	16,4	63	5,7	218	3,9	1,0	0.. 0,3	57	0.. 5	5	3,9	8
200	18,2	63	5,7	218	3,9	1,0	0.. 0,3	57	0.. 5	5	3,9	8
225	20,5	63	5,7	218	3,8	1,0	0.. 0,3	57	0.. 5	5	3,8	8
250	22,7	63	5,7	218	3,8	1,0	0.. 0,3	57	0.. 5	5	3,8	8
280	25,5	63	5,7	218	3,8	1,0	0.. 0,3	57	0.. 5	5	3,8	8
315	28,6	63	5,7	218	3,8	1,0	0.. 0,3	57	0.. 5	5	3,8	8

SDR					13,6		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
110	8,1	63	4,6	220	3,4	1,0	0.. 0,2	46	0.. 5	5	3,4	6
125	9,2	63	4,6	220	3,3	1,0	0.. 0,2	46	0.. 5	5	3,3	6
140	10,3	63	4,6	220	3,3	1,0	0.. 0,2	46	0.. 5	5	3,3	6
160	11,8	63	4,6	220	3,2	1,0	0.. 0,2	46	0.. 5	5	3,2	6
180	13,2	63	4,6	220	3,2	1,0	0.. 0,2	46	0.. 5	5	3,2	6
200	14,7	63	4,6	220	3,2	1,0	0.. 0,2	46	0.. 5	5	3,2	6
225	16,5	63	4,6	220	3,2	1,0	0.. 0,2	46	0.. 5	5	3,2	6
250	18,4	63	4,6	220	3,2	1,0	0.. 0,2	46	0.. 5	5	3,2	6
280	20,6	63	4,6	220	3,1	1,0	0.. 0,2	46	0.. 5	5	3,1	6
315	23,2	63	4,6	220	3,1	1,0	0.. 0,2	46	0.. 5	5	3,1	6

SDR					17		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
110	6,5	63	3,7	220	2,8	0,5	0.. 0,2	37	0.. 5	5	2,8	6
125	7,4	63	3,7	220	2,7	0,5	0.. 0,2	37	0.. 5	5	2,7	6
140	8,2	63	3,7	220	2,7	0,5	0.. 0,2	37	0.. 5	5	2,7	6
160	9,4	63	3,7	220	2,6	0,5	0.. 0,2	37	0.. 5	5	2,6	6
180	10,6	63	3,7	220	2,6	0,5	0.. 0,2	37	0.. 5	5	2,6	6
200	11,8	63	3,7	220	2,6	0,5	0.. 0,2	37	0.. 5	5	2,6	6
225	13,2	63	3,7	220	2,6	0,5	0.. 0,2	37	0.. 5	5	2,6	6
250	14,7	63	3,7	220	2,6	0,5	0.. 0,2	37	0.. 5	5	2,6	6
280	16,5	63	3,7	220	2,6	0,5	0.. 0,2	37	0.. 5	5	2,6	6
315	18,5	63	3,7	220	2,6	0,5	0.. 0,2	37	0.. 5	5	2,6	6

REMEMBER:

In case of PE100 heating temperature must be 220 °C;
DP drag pressure must be added to P1 and P5

SDR							7,4		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5			
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING			
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min		
110	14,9	75	10,1	213	8,5	1,5	0.. 0,6	101	0.. 7	7	8,5	14		
125	16,9	75	10,1	213	8,2	1,5	0.. 0,5	101	0.. 7	7	8,2	14		
140	18,9	75	10,1	213	8,1	1,5	0.. 0,5	101	0.. 7	7	8,1	14		
160	21,6	75	10,1	213	7,9	1,5	0.. 0,5	101	0.. 7	7	7,9	14		
180	24,3	75	10,1	213	7,8	1,5	0.. 0,5	101	0.. 7	7	7,8	14		
200	27,0	75	10,1	213	7,8	1,5	0.. 0,5	101	0.. 7	7	7,8	14		
225	30,4	75	10,1	213	7,7	1,5	0.. 0,5	101	0.. 7	7	7,7	14		
250	33,8	75	10,1	213	7,7	1,5	0.. 0,5	101	0.. 7	7	7,7	14		
280	37,8	75	10,1	213	7,7	1,5	0.. 0,5	101	0.. 7	7	7,7	14		
315	42,6	75	10,1	213	7,7	1,5	0.. 0,5	101	0.. 7	7	7,7	14		

SDR							9		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5			
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING			
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min		
110	12,2	75	8,3	215	7,2	1,5	0.. 0,5	83	0.. 7	7	7,2	12		
125	13,9	75	8,3	215	7,0	1,5	0.. 0,5	83	0.. 7	7	7,0	12		
140	15,6	75	8,3	215	6,8	1,5	0.. 0,5	83	0.. 7	7	6,8	12		
160	17,8	75	8,3	215	6,7	1,5	0.. 0,4	83	0.. 7	7	6,7	12		
180	20,0	75	8,3	215	6,6	1,5	0.. 0,4	83	0.. 7	7	6,6	12		
200	22,2	75	8,3	215	6,6	1,5	0.. 0,4	83	0.. 7	7	6,6	12		
225	25,0	75	8,3	215	6,5	1,5	0.. 0,4	83	0.. 7	7	6,5	12		
250	27,8	75	8,3	215	6,5	1,5	0.. 0,4	83	0.. 7	7	6,5	12		
280	31,1	75	8,3	215	6,5	1,5	0.. 0,4	83	0.. 7	7	6,5	12		
315	35,0	75	8,3	215	6,5	1,5	0.. 0,4	83	0.. 7	7	6,5	12		

SDR							11		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5			
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING			
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min		
110	10,0	75	6,8	216	6,1	1,0	0.. 0,4	68	0.. 6	6	6,1	10		
125	11,4	75	6,8	216	5,9	1,0	0.. 0,4	68	0.. 6	6	5,9	10		
140	12,7	75	6,8	216	5,7	1,0	0.. 0,4	68	0.. 6	6	5,7	10		
160	14,5	75	6,8	216	5,6	1,0	0.. 0,4	68	0.. 6	6	5,6	10		
180	16,4	75	6,8	216	5,6	1,0	0.. 0,4	68	0.. 6	6	5,6	10		
200	18,2	75	6,8	216	5,5	1,0	0.. 0,4	68	0.. 6	6	5,5	10		
225	20,5	75	6,8	216	5,5	1,0	0.. 0,4	68	0.. 6	6	5,5	10		
250	22,7	75	6,8	216	5,5	1,0	0.. 0,4	68	0.. 6	6	5,5	10		
280	25,5	75	6,8	216	5,4	1,0	0.. 0,4	68	0.. 6	6	5,4	10		
315	28,6	75	6,8	216	5,4	1,0	0.. 0,4	68	0.. 6	6	5,4	10		

SDR					13,6		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2	t 2	t 3	t 4	P5 t 5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
110	8,1	75	5,5	218	5,0	1,0	0.. 0,3	55	0.. 5	5	5,0	8
125	9,2	75	5,5	218	4,8	1,0	0.. 0,3	55	0.. 5	5	4,8	8
140	10,3	75	5,5	218	4,7	1,0	0.. 0,3	55	0.. 5	5	4,7	8
160	11,8	75	5,5	218	4,7	1,0	0.. 0,3	55	0.. 5	5	4,7	8
180	13,2	75	5,5	218	4,6	1,0	0.. 0,3	55	0.. 5	5	4,6	8
200	14,7	75	5,5	218	4,6	1,0	0.. 0,3	55	0.. 5	5	4,6	8
225	16,5	75	5,5	218	4,5	1,0	0.. 0,3	55	0.. 5	5	4,5	8
250	18,4	75	5,5	218	4,5	1,0	0.. 0,3	55	0.. 5	5	4,5	8
280	20,6	75	5,5	218	4,5	1,0	0.. 0,3	55	0.. 5	5	4,5	8
315	23,2	75	5,5	218	4,5	1,0	0.. 0,3	55	0.. 5	5	4,5	8

SDR					17		Welding range 110 - 315 mm					
D	S	D	S	T	P1 bordo		P2	t 2	t 3	t 4	P5 t 5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
110	6,5	75	4,4	220	4,1	0,5	0.. 0,3	44	0.. 5	5	4,1	6
125	7,4	75	4,4	220	4,0	0,5	0.. 0,3	44	0.. 5	5	4,0	6
140	8,2	75	4,4	220	3,9	0,5	0.. 0,3	44	0.. 5	5	3,9	6
160	9,4	75	4,4	220	3,8	0,5	0.. 0,3	44	0.. 5	5	3,8	6
180	10,6	75	4,4	220	3,7	0,5	0.. 0,2	44	0.. 5	5	3,7	6
200	11,8	75	4,4	220	3,7	0,5	0.. 0,2	44	0.. 5	5	3,7	6
225	13,2	75	4,4	220	3,7	0,5	0.. 0,2	44	0.. 5	5	3,7	6
250	14,7	75	4,4	220	3,7	0,5	0.. 0,2	44	0.. 5	5	3,7	6
280	16,5	75	4,4	220	3,6	0,5	0.. 0,2	44	0.. 5	5	3,6	6
315	18,5	75	4,4	220	3,6	0,5	0.. 0,2	44	0.. 5	5	3,6	6

REMEMBER:

In case of PE100 heating temperature must be 220 °C;
DP drag pressure must be added to P1 and P5

SDR 7,4							Welding range 125 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
125	16,9	90	12,2	211	12,4	2,0	0.. 0,8	122	0.. 8	8	12,4	16	
140	18,9	90	12,2	211	12,0	2,0	0.. 0,8	122	0.. 8	8	12,0	16	
160	21,6	90	12,2	211	11,7	2,0	0.. 0,8	122	0.. 8	8	11,7	16	
180	24,3	90	12,2	211	11,5	2,0	0.. 0,8	122	0.. 8	8	11,5	16	
200	27,0	90	12,2	211	11,4	2,0	0.. 0,8	122	0.. 8	8	11,4	16	
225	30,4	90	12,2	211	11,3	2,0	0.. 0,8	122	0.. 8	8	11,3	16	
250	33,8	90	12,2	211	11,2	2,0	0.. 0,7	122	0.. 8	8	11,2	16	
280	37,8	90	12,2	211	11,1	2,0	0.. 0,7	122	0.. 8	8	11,1	16	
315	42,6	90	12,2	211	11,1	2,0	0.. 0,7	122	0.. 8	8	11,1	16	

SDR 9							Welding range 125 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
125	13,9	90	10,0	213	10,6	1,5	0.. 0,7	100	0.. 7	7	10,6	14	
140	15,6	90	10,0	213	10,2	1,5	0.. 0,7	100	0.. 7	7	10,2	14	
160	17,8	90	10,0	213	9,9	1,5	0.. 0,7	100	0.. 7	7	9,9	14	
180	20,0	90	10,0	213	9,7	1,5	0.. 0,6	100	0.. 7	7	9,7	14	
200	22,2	90	10,0	213	9,6	1,5	0.. 0,6	100	0.. 7	7	9,6	14	
225	25,0	90	10,0	213	9,5	1,5	0.. 0,6	100	0.. 7	7	9,5	14	
250	27,8	90	10,0	213	9,5	1,5	0.. 0,6	100	0.. 7	7	9,5	14	
280	31,1	90	10,0	213	9,4	1,5	0.. 0,6	100	0.. 7	7	9,4	14	
315	35,0	90	10,0	213	9,4	1,5	0.. 0,6	100	0.. 7	7	9,4	14	

SDR 11							Welding range 125 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
125	11,4	90	8,2	215	8,9	1,5	0.. 0,6	82	0.. 6	6	8,9	11	
140	12,7	90	8,2	215	8,6	1,5	0.. 0,6	82	0.. 6	6	8,6	11	
160	14,5	90	8,2	215	8,3	1,5	0.. 0,6	82	0.. 6	6	8,3	11	
180	16,4	90	8,2	215	8,2	1,5	0.. 0,5	82	0.. 6	6	8,2	11	
200	18,2	90	8,2	215	8,1	1,5	0.. 0,5	82	0.. 6	6	8,1	11	
225	20,5	90	8,2	215	8,0	1,5	0.. 0,5	82	0.. 6	6	8,0	11	
250	22,7	90	8,2	215	7,9	1,5	0.. 0,5	82	0.. 6	6	7,9	11	
280	25,5	90	8,2	215	7,9	1,5	0.. 0,5	82	0.. 6	6	7,9	11	
315	28,6	90	8,2	215	7,8	1,5	0.. 0,5	82	0.. 6	6	7,8	11	

SDR					13,6		Welding range 125 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
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125	9,2	90	6,6	217	7,4	1,0	0.. 0,5	66	0.. 6	6	7,4	9	
140	10,3	90	6,6	217	7,1	1,0	0.. 0,5	66	0.. 6	6	7,1	9	
160	11,8	90	6,6	217	6,9	1,0	0.. 0,5	66	0.. 6	6	6,9	9	
180	13,2	90	6,6	217	6,8	1,0	0.. 0,5	66	0.. 6	6	6,8	9	
200	14,7	90	6,6	217	6,7	1,0	0.. 0,4	66	0.. 6	6	6,7	9	
225	16,5	90	6,6	217	6,6	1,0	0.. 0,4	66	0.. 6	6	6,6	9	
250	18,4	90	6,6	217	6,5	1,0	0.. 0,4	66	0.. 6	6	6,5	9	
280	20,6	90	6,6	217	6,5	1,0	0.. 0,4	66	0.. 6	6	6,5	9	
315	23,2	90	6,6	217	6,5	1,0	0.. 0,4	66	0.. 6	6	6,5	9	

SDR					17		Welding range 125 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
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125	7,4	90	5,3	219	6,0	1,0	0.. 0,4	53	0.. 5	5	6,0	7	
140	8,2	90	5,3	219	5,8	1,0	0.. 0,4	53	0.. 5	5	5,8	7	
160	9,4	90	5,3	219	5,6	1,0	0.. 0,4	53	0.. 5	5	5,6	7	
180	10,6	90	5,3	219	5,5	1,0	0.. 0,4	53	0.. 5	5	5,5	7	
200	11,8	90	5,3	219	5,4	1,0	0.. 0,4	53	0.. 5	5	5,4	7	
225	13,2	90	5,3	219	5,4	1,0	0.. 0,4	53	0.. 5	5	5,4	7	
250	14,7	90	5,3	219	5,3	1,0	0.. 0,4	53	0.. 5	5	5,3	7	
280	16,5	90	5,3	219	5,3	1,0	0.. 0,4	53	0.. 5	5	5,3	7	
315	18,5	90	5,3	219	5,3	1,0	0.. 0,4	53	0.. 5	5	5,3	7	

REMEMBER:

In case of PE100 heating temperature must be 220 °C;
DP drag pressure must be added to P1 and P5

SDR 7,4							Welding range 140 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
140	18,9	110	14,9	209	19,3	2,0	0.. 1,3	149	0.. 9	9	19,3	19	
160	21,6	110	14,9	209	18,3	2,0	0.. 1,2	149	0.. 9	9	18,3	19	
180	24,3	110	14,9	209	17,7	2,0	0.. 1,2	149	0.. 9	9	17,7	19	
200	27,0	110	14,9	209	17,4	2,0	0.. 1,2	149	0.. 9	9	17,4	19	
225	30,4	110	14,9	209	17,1	2,0	0.. 1,1	149	0.. 9	9	17,1	19	
250	33,8	110	14,9	209	17,0	2,0	0.. 1,1	149	0.. 9	9	17,0	19	
280	37,8	110	14,9	209	16,8	2,0	0.. 1,1	149	0.. 9	9	16,8	19	
315	42,6	110	14,9	209	16,7	2,0	0.. 1,1	149	0.. 9	9	16,7	19	

SDR 9							Welding range 140 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
140	15,6	110	12,2	211	16,5	2,0	0.. 1,1	122	0.. 8	8	16,5	16	
160	17,8	110	12,2	211	15,5	2,0	0.. 1,0	122	0.. 8	8	15,5	16	
180	20,0	110	12,2	211	15,1	2,0	0.. 1,0	122	0.. 8	8	15,1	16	
200	22,2	110	12,2	211	14,8	2,0	0.. 1,0	122	0.. 8	8	14,8	16	
225	25,0	110	12,2	211	14,5	2,0	0.. 1,0	122	0.. 8	8	14,5	16	
250	27,8	110	12,2	211	14,4	2,0	0.. 1,0	122	0.. 8	8	14,4	16	
280	31,1	110	12,2	211	14,2	2,0	0.. 0,9	122	0.. 8	8	14,2	16	
315	35,0	110	12,2	211	14,1	2,0	0.. 0,9	122	0.. 8	8	14,1	16	

SDR 11							Welding range 140 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
140	12,7	110	10,0	213	13,9	1,5	0.. 0,9	100	0.. 7	7	13,9	14	
160	14,5	110	10,0	213	13,1	1,5	0.. 0,9	100	0.. 7	7	13,1	14	
180	16,4	110	10,0	213	12,7	1,5	0.. 0,8	100	0.. 7	7	12,7	14	
200	18,2	110	10,0	213	12,4	1,5	0.. 0,8	100	0.. 7	7	12,4	14	
225	20,5	110	10,0	213	12,2	1,5	0.. 0,8	100	0.. 7	7	12,2	14	
250	22,7	110	10,0	213	12,0	1,5	0.. 0,8	100	0.. 7	7	12,0	14	
280	25,5	110	10,0	213	11,9	1,5	0.. 0,8	100	0.. 7	7	11,9	14	
315	28,6	110	10,0	213	11,8	1,5	0.. 0,8	100	0.. 7	7	11,8	14	

SDR 13,6							Welding range 140 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
140	10,3	110	8,1	215	11,6	1,5	0.. 0,8	81	0.. 6	6	11,6	11	
160	11,8	110	8,1	215	10,9	1,5	0.. 0,7	81	0.. 6	6	10,9	11	
180	13,2	110	8,1	215	10,5	1,5	0.. 0,7	81	0.. 6	6	10,5	11	
200	14,7	110	8,1	215	10,2	1,5	0.. 0,7	81	0.. 6	6	10,2	11	
225	16,5	110	8,1	215	10,1	1,5	0.. 0,7	81	0.. 6	6	10,1	11	
250	18,4	110	8,1	215	9,9	1,5	0.. 0,7	81	0.. 6	6	9,9	11	
280	20,6	110	8,1	215	9,8	1,5	0.. 0,7	81	0.. 6	6	9,8	11	
315	23,2	110	8,1	215	9,8	1,5	0.. 0,7	81	0.. 6	6	9,8	11	

SDR					17		Welding range 140 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
140	8,2	110	6,5	217	9,5	1,0	0.. 0,6	65	0.. 6	6	9,5	9	
160	9,4	110	6,5	217	8,9	1,0	0.. 0,6	65	0.. 6	6	8,9	9	
180	10,6	110	6,5	217	8,5	1,0	0.. 0,6	65	0.. 6	6	8,5	9	
200	11,8	110	6,5	217	8,3	1,0	0.. 0,6	65	0.. 6	6	8,3	9	
225	13,2	110	6,5	217	8,2	1,0	0.. 0,5	65	0.. 6	6	8,2	9	
250	14,7	110	6,5	217	8,1	1,0	0.. 0,5	65	0.. 6	6	8,1	9	
280	16,5	110	6,5	217	8,0	1,0	0.. 0,5	65	0.. 6	6	8,0	9	
315	18,5	110	6,5	217	7,9	1,0	0.. 0,5	65	0.. 6	6	7,9	9	

REMEMBER:

In case of PE100 heating temperature must be 220 °C;

DP drag pressure must be added to P1 and P5

SDR							7,4		Welding range 160 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5			
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING			
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min		
160	21,6	125	16,9	208	24,8	2,0	0.. 1,7	169	0.. 9	10	24,8	22		
180	24,3	125	16,9	208	23,7	2,0	0.. 1,6	169	0.. 9	10	23,7	22		
200	27,0	125	16,9	208	23,0	2,0	0.. 1,5	169	0.. 9	10	23,0	22		
225	30,4	125	16,9	208	22,5	2,0	0.. 1,5	169	0.. 9	10	22,5	22		
250	33,8	125	16,9	208	22,2	2,0	0.. 1,5	169	0.. 9	10	22,2	22		
280	37,8	125	16,9	208	21,9	2,0	0.. 1,5	169	0.. 9	10	21,9	22		
315	42,6	125	16,9	208	21,7	2,0	0.. 1,4	169	0.. 9	10	21,7	22		

SDR							9		Welding range 160 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5			
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING			
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min		
160	17,8	125	13,9	210	21,2	2,0	0.. 1,4	139	0.. 9	9	21,2	18		
180	20,0	125	13,9	210	20,1	2,0	0.. 1,3	139	0.. 9	9	20,1	18		
200	22,2	125	13,9	210	19,6	2,0	0.. 1,3	139	0.. 9	9	19,6	18		
225	25,0	125	13,9	210	19,1	2,0	0.. 1,3	139	0.. 9	9	19,1	18		
250	27,8	125	13,9	210	18,8	2,0	0.. 1,3	139	0.. 9	9	18,8	18		
280	31,1	125	13,9	210	18,6	2,0	0.. 1,2	139	0.. 9	9	18,6	18		
315	35,0	125	13,9	210	18,4	2,0	0.. 1,2	139	0.. 9	9	18,4	18		

SDR							11		Welding range 160 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5			
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING			
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min		
160	14,5	125	11,4	212	17,9	1,5	0.. 1,2	114	0.. 8	8	17,9	15		
180	16,4	125	11,4	212	17,0	1,5	0.. 1,1	114	0.. 8	8	17,0	15		
200	18,2	125	11,4	212	16,4	1,5	0.. 1,1	114	0.. 8	8	16,4	15		
225	20,5	125	11,4	212	16,0	1,5	0.. 1,1	114	0.. 8	8	16,0	15		
250	22,7	125	11,4	212	15,8	1,5	0.. 1,1	114	0.. 8	8	15,8	15		
280	25,5	125	11,4	212	15,6	1,5	0.. 1,0	114	0.. 8	8	15,6	15		
315	28,6	125	11,4	212	15,4	1,5	0.. 1,0	114	0.. 8	8	15,4	15		

SDR							13,6		Welding range 160 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5			
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING			
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min		
160	11,8	125	9,2	214	14,9	1,5	0.. 1,0	92	0.. 7	7	14,9	13		
180	13,2	125	9,2	214	14,1	1,5	0.. 0,9	92	0.. 7	7	14,1	13		
200	14,7	125	9,2	214	13,6	1,5	0.. 0,9	92	0.. 7	7	13,6	13		
225	16,5	125	9,2	214	13,3	1,5	0.. 0,9	92	0.. 7	7	13,3	13		
250	18,4	125	9,2	214	13,0	1,5	0.. 0,9	92	0.. 7	7	13,0	13		
280	20,6	125	9,2	214	12,8	1,5	0.. 0,9	92	0.. 7	7	12,8	13		
315	23,2	125	9,2	214	12,7	1,5	0.. 0,8	92	0.. 7	7	12,7	13		

SDR					17		Welding range 160 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
160	9,4	125	7,4	216	12,2	1,5	0.. 0,8	74	0.. 6	6	12,2	10	
180	10,6	125	7,4	216	11,5	1,5	0.. 0,8	74	0.. 6	6	11,5	10	
200	11,8	125	7,4	216	11,1	1,5	0.. 0,7	74	0.. 6	6	11,1	10	
225	13,2	125	7,4	216	10,8	1,5	0.. 0,7	74	0.. 6	6	10,8	10	
250	14,7	125	7,4	216	10,6	1,5	0.. 0,7	74	0.. 6	6	10,6	10	
280	16,5	125	7,4	216	10,5	1,5	0.. 0,7	74	0.. 6	6	10,5	10	
315	18,5	125	7,4	216	10,3	1,5	0.. 0,7	74	0.. 6	6	10,3	10	

REMEMBER:

In case of PE100 heating temperature must be 220 °C;
DP drag pressure must be added to P1 and P5

SDR							7,4							Welding range 180 - 315 mm				
D	S	D	S	T	P1 bordo		P2		t 2	t 3	t 4	P5 t 5						
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING							
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min						
180	24,3	140	18,9	206	31,1	2,0	0.. 2,1	189	0.. 10	11	31,1	24						
200	27,0	140	18,9	206	29,8	2,0	0.. 2,0	189	0.. 10	11	29,8	24						
225	30,4	140	18,9	206	28,9	2,0	0.. 1,9	189	0.. 10	11	28,9	24						
250	33,8	140	18,9	206	28,3	2,0	0.. 1,9	189	0.. 10	11	28,3	24						
280	37,8	140	18,9	206	27,8	2,0	0.. 1,9	189	0.. 10	11	27,8	24						
315	42,6	140	18,9	206	27,5	2,0	0.. 1,8	189	0.. 10	11	27,5	24						

SDR							9							Welding range 180 - 315 mm				
D	S	D	S	T	P1 bordo		P2		t 2	t 3	t 4	P5 t 5						
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING							
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min						
180	20,0	140	15,6	208	26,5	2,0	0.. 1,8	156	0.. 9	10	26,5	20						
200	22,2	140	15,6	208	25,3	2,0	0.. 1,7	156	0.. 9	10	25,3	20						
225	25,0	140	15,6	208	24,5	2,0	0.. 1,6	156	0.. 9	10	24,5	20						
250	27,8	140	15,6	208	24,0	2,0	0.. 1,6	156	0.. 9	10	24,0	20						
280	31,1	140	15,6	208	23,6	2,0	0.. 1,6	156	0.. 9	10	23,6	20						
315	35,0	140	15,6	208	23,3	2,0	0.. 1,6	156	0.. 9	10	23,3	20						

SDR							11							Welding range 180 - 315 mm				
D	S	D	S	T	P1 bordo		P2		t 2	t 3	t 4	P5 t 5						
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING							
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min						
180	16,4	140	12,7	210	22,4	2,0	0.. 1,5	127	0.. 8	8	22,4	17						
200	18,2	140	12,7	210	21,3	2,0	0.. 1,4	127	0.. 8	8	21,3	17						
225	20,5	140	12,7	210	20,6	2,0	0.. 1,4	127	0.. 8	8	20,6	17						
250	22,7	140	12,7	210	20,1	2,0	0.. 1,3	127	0.. 8	8	20,1	17						
280	25,5	140	12,7	210	19,8	2,0	0.. 1,3	127	0.. 8	8	19,8	17						
315	28,6	140	12,7	210	19,5	2,0	0.. 1,3	127	0.. 8	8	19,5	17						

SDR							13,6							Welding range 180 - 315 mm				
D	S	D	S	T	P1 bordo		P2		t 2	t 3	t 4	P5 t 5						
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING							
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min						
180	13,2	140	10,3	213	18,6	1,5	0.. 1,2	103	0.. 7	7	18,6	14						
200	14,7	140	10,3	213	17,7	1,5	0.. 1,2	103	0.. 7	7	17,7	14						
225	16,5	140	10,3	213	17,0	1,5	0.. 1,1	103	0.. 7	7	17,0	14						
250	18,4	140	10,3	213	16,7	1,5	0.. 1,1	103	0.. 7	7	16,7	14						
280	20,6	140	10,3	213	16,3	1,5	0.. 1,1	103	0.. 7	7	16,3	14						
315	23,2	140	10,3	213	16,1	1,5	0.. 1,1	103	0.. 7	7	16,1	14						

SDR					17		Welding range 180 - 315 mm						
D	S	D	S	T	P1 bordo		P2 t2		t3	t4	P5 t5		
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING		
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min	
180	10,6	140	8,2	215	15,3	1,5	0.. 1,0	82	0.. 6	6	15,3	11	
200	11,8	140	8,2	215	14,5	1,5	0.. 1,0	82	0.. 6	6	14,5	11	
225	13,2	140	8,2	215	13,9	1,5	0.. 0,9	82	0.. 6	6	13,9	11	
250	14,7	140	8,2	215	13,6	1,5	0.. 0,9	82	0.. 6	6	13,6	11	
280	16,5	140	8,2	215	13,3	1,5	0.. 0,9	82	0.. 6	6	13,3	11	
315	18,5	140	8,2	215	13,1	1,5	0.. 0,9	82	0.. 6	6	13,1	11	

REMEMBER:

In case of PE100 heating temperature must be 220 °C;
DP drag pressure must be added to P1 and P5

SDR					7,4		Welding range 200 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t 2		t 3	t 4	P5 t 5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
200	27,0	160	21,6	205	41,2	2,5	0.. 2,7	216	0.. 11	12	41,2	27
225	30,4	160	21,6	205	39,1	2,5	0.. 2,6	216	0.. 11	12	39,1	27
250	33,8	160	21,6	205	37,9	2,5	0.. 2,5	216	0.. 11	12	37,9	27
280	37,8	160	21,6	205	37,1	2,5	0.. 2,5	216	0.. 11	12	37,1	27
315	42,6	160	21,6	205	36,4	2,5	0.. 2,4	216	0.. 11	12	36,4	27
SDR					9		Welding range 200 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t 2		t 3	t 4	P5 t 5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
200	22,2	160	17,8	207	35,2	2,0	0.. 2,3	178	0.. 10	10	35,2	23
225	25,0	160	17,8	207	33,3	2,0	0.. 2,2	178	0.. 10	10	33,3	23
250	27,8	160	17,8	207	32,2	2,0	0.. 2,1	178	0.. 10	10	32,2	23
280	31,1	160	17,8	207	31,4	2,0	0.. 2,1	178	0.. 10	10	31,4	23
315	35,0	160	17,8	207	30,9	2,0	0.. 2,1	178	0.. 10	10	30,9	23
SDR					11		Welding range 200 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t 2		t 3	t 4	P5 t 5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
200	18,2	160	14,5	209	29,7	2,0	0.. 2,0	145	0.. 9	9	29,7	19
225	20,5	160	14,5	209	28,0	2,0	0.. 1,9	145	0.. 9	9	28,0	19
250	22,7	160	14,5	209	27,1	2,0	0.. 1,8	145	0.. 9	9	27,1	19
280	25,5	160	14,5	209	26,4	2,0	0.. 1,8	145	0.. 9	9	26,4	19
315	28,6	160	14,5	209	25,9	2,0	0.. 1,7	145	0.. 9	9	25,9	19
SDR					13,6		Welding range 200 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t 2		t 3	t 4	P5 t 5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
200	14,7	160	11,8	211	24,8	1,5	0.. 1,7	118	0.. 8	8	24,8	16
225	16,5	160	11,8	211	23,3	1,5	0.. 1,6	118	0.. 8	8	23,3	16
250	18,4	160	11,8	211	22,4	1,5	0.. 1,5	118	0.. 8	8	22,4	16
280	20,6	160	11,8	211	21,8	1,5	0.. 1,5	118	0.. 8	8	21,8	16
315	23,2	160	11,8	211	21,4	1,5	0.. 1,4	118	0.. 8	8	21,4	16
SDR					17		Welding range 200 - 315 mm					
D	S	D	S	T	P1 bordo		P2 t 2		t 3	t 4	P5 t 5	
PIPE DIAMETER	PIPE THICKNESS	BRANCH DIAMETER	BRANCH THICKNESS	TEMP.	BEAD FORMATION		HEATING		MIR. REM.	RAMP	COOLING	
mm	mm	mm	mm	°C	bar	mm	bar	sec	sec	sec	bar	min
200	11,8	160	9,4	214	20,3	1,5	0.. 1,4	94	0.. 7	7	20,3	13
225	13,2	160	9,4	214	19,0	1,5	0.. 1,3	94	0.. 7	7	19,0	13
250	14,7	160	9,4	214	18,3	1,5	0.. 1,2	94	0.. 7	7	18,3	13
280	16,5	160	9,4	214	17,8	1,5	0.. 1,2	94	0.. 7	7	17,8	13
315	18,5	160	9,4	214	17,4	1,5	0.. 1,2	94	0.. 7	7	17,4	13

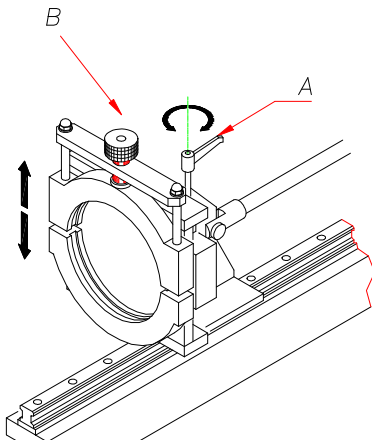
REMEMBER:

In case of PE100 heating temperature must be 220 °C;
DP 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:

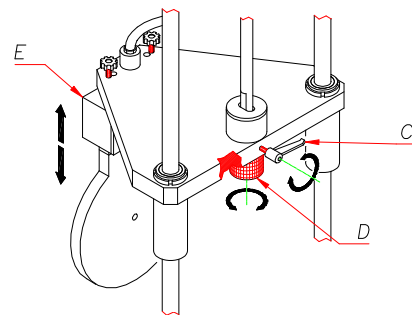
Vertical Adjustment of Fitting Clamp



- Insert the fitting into the clamp
- Release the lever A , in this way the clamps can be move a little in vertical way
- Bring the fitting in contact with the pipe in order that will be self centering
- Fix the lever A
- Tighten the fixing clamp hand wheel B

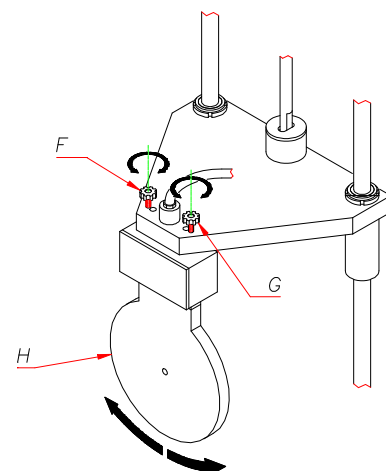
Vertical Adjustment of the Heating Mirror

- Take down the heating mirror
- Bring the bushes in contact with the fitting and the pipe
- If necessary proceed to the adjustment of the heating mirror vertical position by means of releasing the lever C and by acting on the knob D
- After the adjustment have been done fix the lever C



Hunting Adjustment of the Heating Mirror

- If necessary carry out the heating mirror hunting adjustment by means of acting on handwheels F and G



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 .

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 (alcool)
- 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.

This manual has been printed on November 2015

The technical data and information contained in this manual can be changed without any notice