FINN-POWER
LILLBACKA

OPERATING INSTRUCTIONS

FINN-POWER

P20 MS ☐
P20 IS/AS ☐
P20 VS ☐
P21 MS ☐
P21 IS/AS ☐
P21 VS ☐
P32 MS ☐
P32 IS/AS ☐
P32 VS ☐
P51 IS/AS ☐
P51 VS ☐
CC22 IS/AS ☐
CC22 VS ☐

MANUFACTURING YEAR _____

CE

RELEASED 06/00

KEEP THIS MANUAL FOR FUTURE NEEDS

THE MACHINE HAS BEEN DESIGNED FOR CRIMPING HOSE FITTINGS. LILLBACKA POWERCO SHALL NOT BE HELD LIABLE FOR ANY PRODUCT WHICH HAS BEEN CRIMPED ON THE MACHINE. THE MACHINE HAS BEEN DESIGNED TO OPERATE IN ROOM TEMPERATURE, IN DRY INDOOR CONDITIONS AND IN SUFFICIENT ILLUMINATION. USING THE MACHINE FOR ANY OTHER PURPOSE IS NOT ALLOWED WITHOUT WRITTEN CONSENT FROM THE FACTORY.

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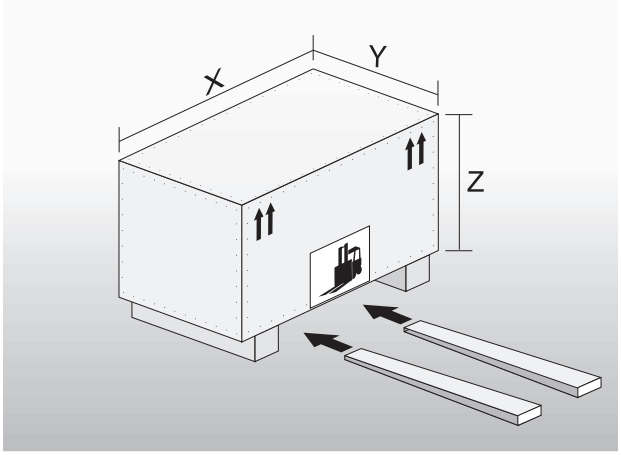
CONTENTS

GENERAL

FINN-POWER crimping machines are electrically operated hydraulic crimping machines for hydraulic hose assemblies.
The crimping machine comprises a crimping head and a hydraulic unit mounted on the oil tank which serves as machine frame.
FINN-POWER crimping machine is normally delivered with a 3-phase electric motor. On request it can be equipped with a single phase motor.

Transport

The packed machine is transported on a pallet, which is easy to move and lift by a fork-lift truck. After unpacking, the machine can be lifted using a hoisting belt.
Size of package for P51-models:
x = 102, y = 82, z = 113 cm.
Size of package for other models:
x = 77, y = 62, z = 81 cm.



Pakkaus1.eps

Storage

The manufacturer has protected the machine against corrosion by using the Zerust method. The machined parts have been treated with Axxatec 77C protective agent. A Zerust vapor capsule has been put into the electric box, and the machine has been packed into a bag made of Zerust film.

The protection is effective for months if the package is not opened. After opening it, the protection of the wrapping film ceases. If the machine is not yet brought into use, it must be reprotected against corrosion. The machine is to be stored in dry indoor conditions.

Remove the protective agent according to the instructions enclosed in the package.

Mounting

The adjacent picture shows an appropriate way to lift the machine after it has been unpacked.

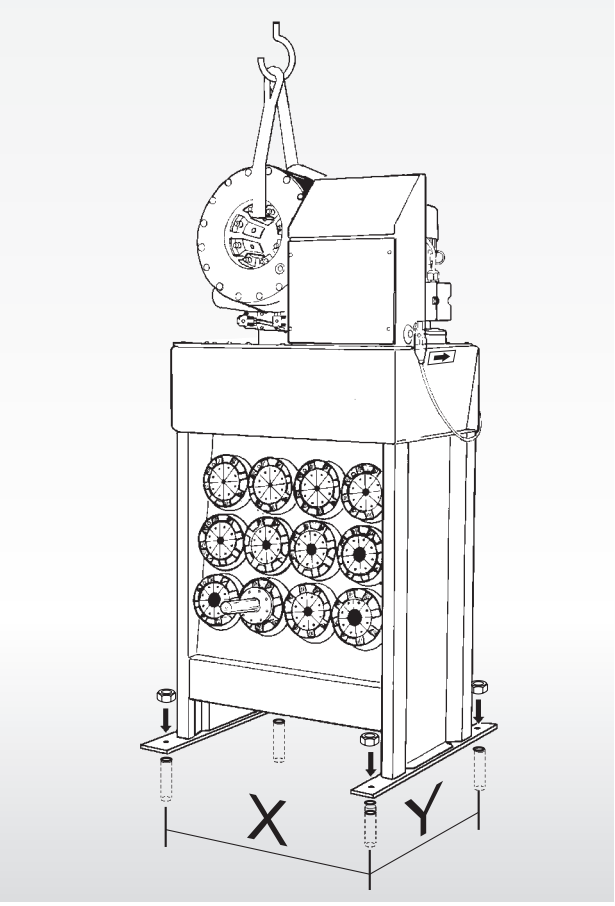
It is recommended to mount the machine on a Finn-Power table. Before mounting, the table must be screwed on the floor with four M12 wedge anchors. Boreholes in the floor: Ø 12 mm, depth 55 mm.

When the machine is mounted on a Finn-Power table, the four shoes under the machine are removed.

The table with assembly instructions is packed separately.

The crimper may be installed on some other table as well, provided it is sturdy and broad enough or it has been fastened on the floor so that it cannot fall over. Furthermore, there must be a hole in the table to enable emptying the oil tank through the drain plug.

P20, P21 and CC22 -models: x = 558, y = 560
P32 and P51 -models: x = 625, y = 560.



Insta_32.eps

WARNINGS

General

The machine is intended for professional use. It is to be operated only by a trained operator who has understood the dangers involved in the operation.

Openings between the dies exceed 6 mm, thus being large enough to let fingers go between the dies and get crimped. It is, therefore, **ABSOLUTELY** necessary to follow operating instructions and warnings indicated by the stickers on the machine when changing dies and crimping fittings.

Danger zones

003199.eps

WARNING 1
Do not put your hands inside the dies while the motor is running!

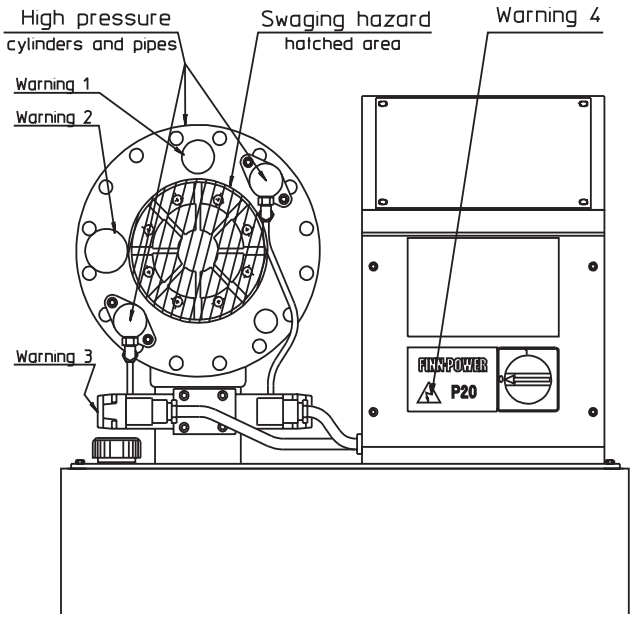
003306.eps

WARNING 2
When crimping a fitting, hold the hose far enough to avoid crimping your hand!

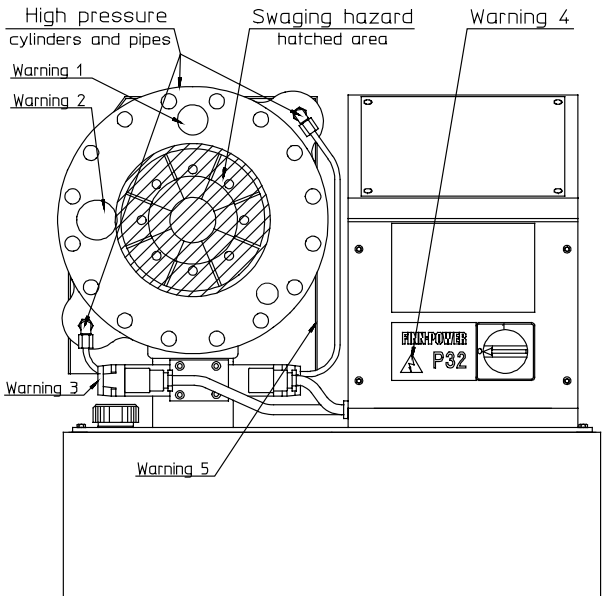
WARNING 3
Dies open and close by depressing the hand emergency push-buttons at both ends of the valve. Do not touch these push-buttons during normal operation!

003002.eps

WARNING 4
High voltage.
The electric box is to be opened only by a professional electrician!



P20dange.eps

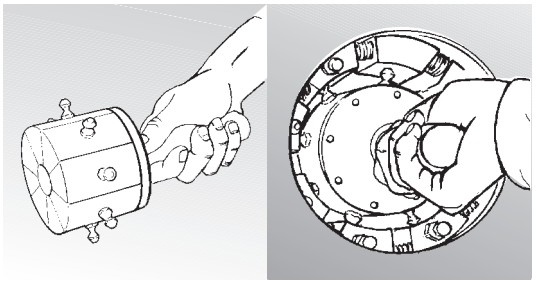


P32var.hgl

WARNING 5 (P32 model)

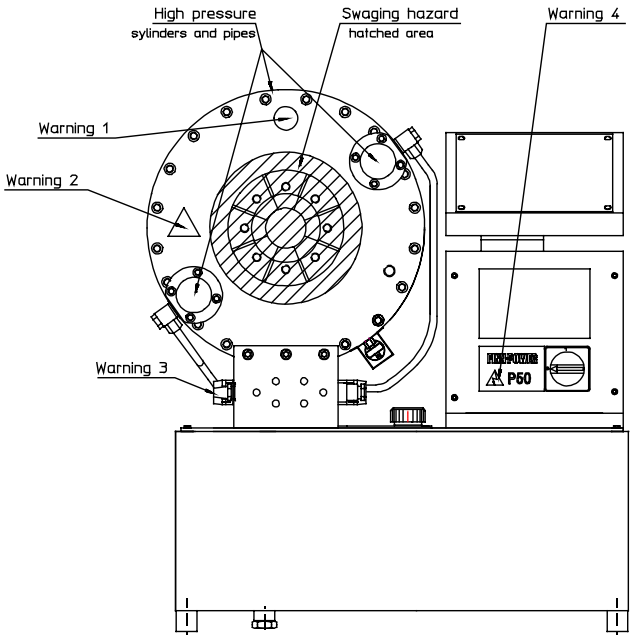
The rear of the crimping head is covered by a housing protecting the operator from the crimping hazard under the housing between rear flange and cylinder.
Do not remove this housing!

keeptool.eps



WARNING 6

When changing dies with the quick change tool, hold the handle as shown in the above figures. Make sure your hand will not get between the dies!



P50var.hgl

COMMISSIONING

Oil fill

Fill the oil tank to centre line of the indicators in the dipstick with hydraulic oil like Shell Tellus T46 or equivalent. Volume of the tank is 32 litres (P51 –model: 50 litres).

It is recommended to pump the oil into the tank through a 20 μ filter, because new oil in drums is not pure.

Electrical connection

CAUTION! Check that the machine voltage (see type plate) is equal to your supply voltage. For proper installation to local code, consult a licensed contractor.

Bring the supply cable in through the hole in the side panel of the electric box. Secure the cable with a stress relief plug.

3-phase: Connect the phase conductors to the respective L1, L2 and L3 terminals in the supply disconnecting device. Connect the earth connection to the ground terminal on the fixing plate. Check the connection against the wiring diagram enclosed in the spare parts list.

Check that the motor rotation is parallel with the arrow on the tank close to the motor. In case the motor rotates in wrong direction, two phase conductors in the supply disconnecting device must be interchanged.

1-phase: Connect the phase and the neutral to the respective terminals in the supply disconnecting device. Connect the earth connection to the ground terminal on the fixing plate. Check the connection against the wiring diagram enclosed in the spare parts list.

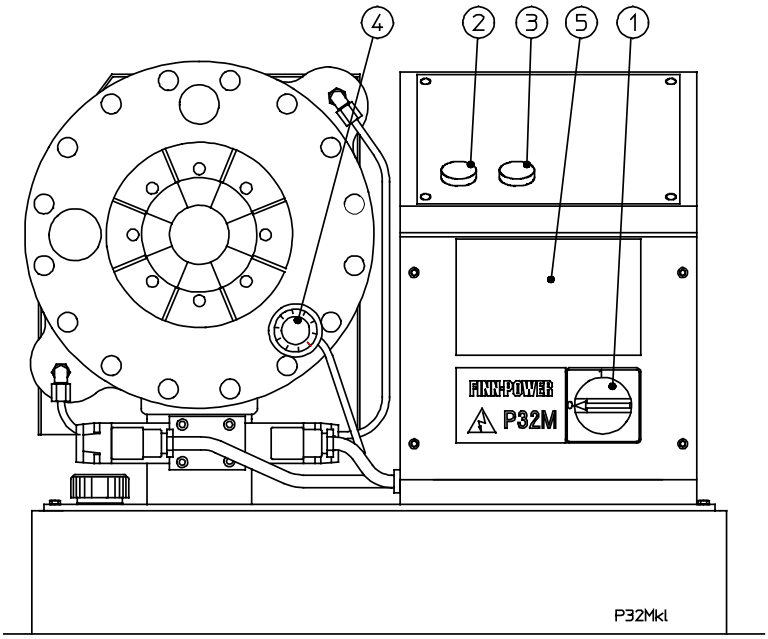
Quick Fix-package

Included with the machine, there is a Quick Fix-package which has some basic parts for that machine model.

OPERATION

Control identification MS -control

1. **Supply disconnecting device** for starting and stopping the motor. The device is used to separate the machine from power supply. However, the undervoltage trip can be made dead only by disconnecting the plug or supply cable from the mains.
2. As long as the **crimping push-button** is depressed, the dies will close until the button is released or the preset crimping diameter is reached.
3. **Retraction button.** When depressed and held down, the dies will open until the button is released or the maximum retraction is reached.
4. **Crimping diameter dial.**
5. **Die chart** with crimping diameter range for each die set and corresponding dial adjustment values.

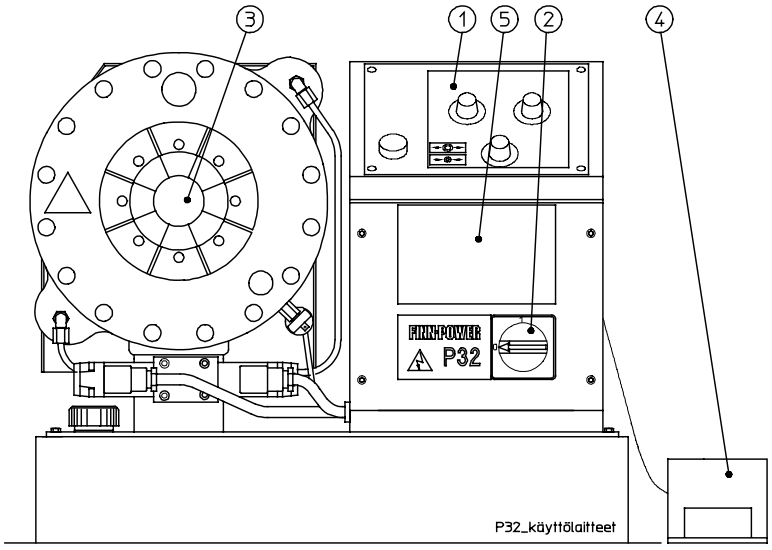


P32Mkl.hgl

The main operating area of the machine is in front of the controls.

Control identification IS/AS/VS -controls

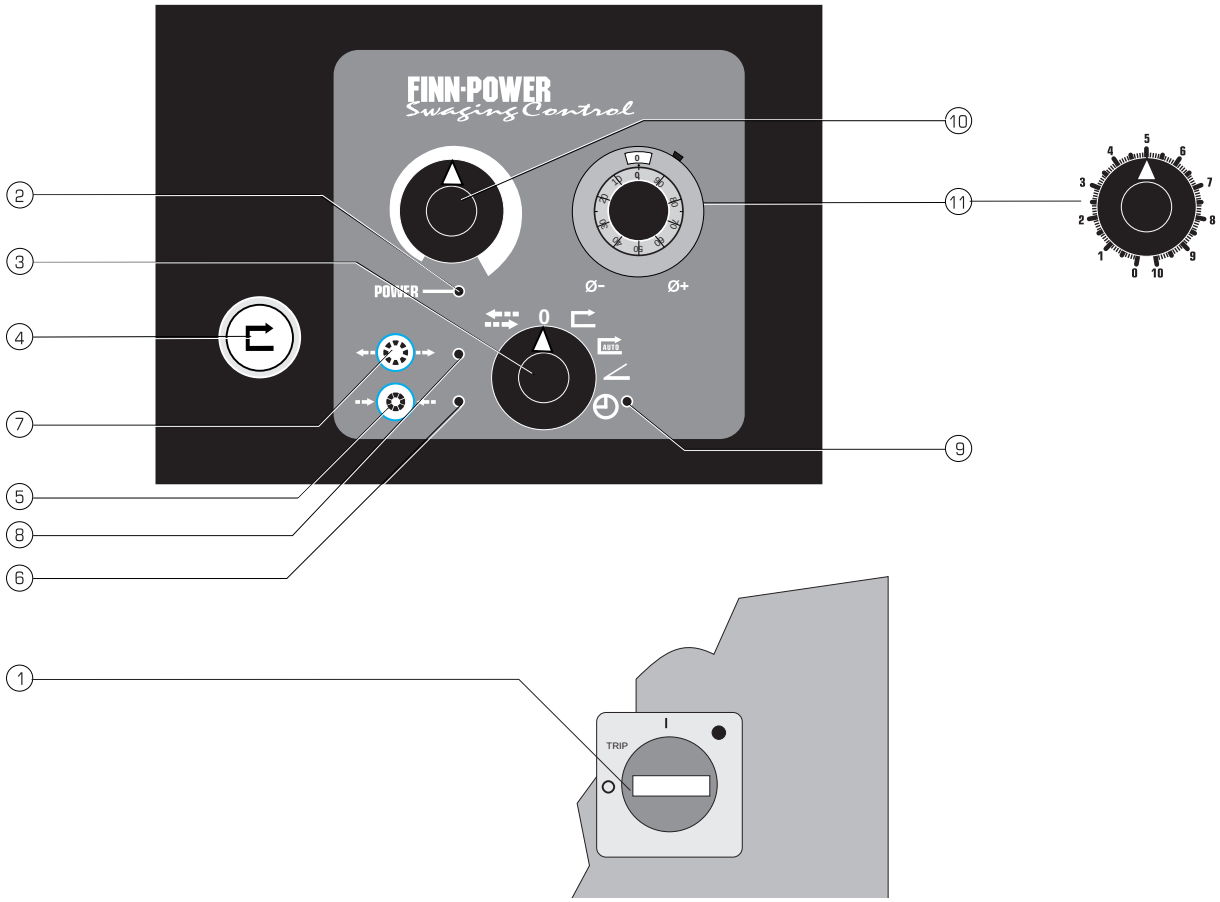
1. **Control panel**
2. **Supply disconnecting device** for starting and stopping the motor. The device is used to disconnect the machine from power supply. However the undervoltage trip can be made dead only by disconnecting the plug or supply cable from the mains.
3. When the **stop device** is pressed, the dies will perform a crimping cycle.
4. When the **foot pedal** is pressed, the dies will perform a crimping cycle. (Optional)
5. IS/AS –models**: Die chart** with crimping diameter range for each die set and corresponding dial adjustment values.



P32iskl.hgl

The main operating area of the machine is in front of the controls.

Control panel IS/AS



P20aepan.eps

1. SUPPLY DISCONNECTING DEVICE

The supply disconnecting device starts and stops the motor. It is used to disconnect the machine from power supply. However, the undervoltage trip can be made dead only by disconnecting the plug or supply cable from the mains.
In case of power failure, the motor stops and the handle turns to the so called TRIP position. Restart the machine by turning the handle first to 0-position (reset) and after that to I-position. In an emergency, the supply disconnecting device is used as an emergency stop.

2. CONTROL OPERATIONAL

The signal lamp is illuminated when operating voltage is available and the control is ready for use.

3. MODE SELECTOR

The crimping head does not operate when the mode selector is in position 0. The mode selector should be in 0-position when the machine is started.

MANUAL : Master dies can be opened by pressing retraction button 7 and closed by pressing crimping button 5. Manual mode is used when changing dies and adjusting settings. Ees-taas.wmf

SEMI-AUTOMATIC : Crimping movement gets started when the semi-automatic crimping button 4 is pressed. The movement can be interrupted by releasing the button. If need be, dies can be opened by using retraction button 7. Crimping goes on when the button is repressed. After reaching the crimping diameter, dies return to the retraction position irrespective of whether the button is pressed or not.

Cycle.wmf

AUTOMATIC : Crimping movement gets started when the fitting is pressed against the stop device. The movement stops if the stop device is not adequately pressed by the fitting. It can also be stopped by withdrawing the fitting from the stop device before it is gripped by dies. If need be, dies can be opened by using retraction button 7. Crimping goes on when the fitting is repressed against the stop device. After reaching the crimping diameter, dies return to the retraction position irrespective of whether the fitting is pressed against the stop device or not.

Autopres.wmf

FOOT PEDAL : Crimping starts when the foot pedal is pressed. The movement can be interrupted by lifting the foot from the pedal. If need be, dies can be opened by using retraction button 7. Crimping goes on when the foot pedal is repressed. After reaching the crimping diameter, dies return to the retraction position irrespective of the position of the foot pedal.

Foot-pdl.wmf

CRIMPING DELAY : In automatic modes, a crimping delay can be set in order to improve the forming of the fitting. The delay is activated by turning the mode selector to the delay position , which makes the signal lamp beside the symbol light. After this the mode selector is turned to a position indicating the intended mode of crimping.
The delay has been set to last approx 2 seconds. It occurs after the crimping diameter has been reached but before the retraction movement, i.e. the dies are kept closed for the time of delay, after which they are opened. To inactivate the delay, turn the mode selector briefly to 0-postition or stop the motor.

clock.eps

4. SEMI-AUTOMATIC CRIMPING

This button starts crimping movement provided that master dies have reached the set retraction position (signal lamp 8 is illuminated) and semi-automatic mode has been selected.

5. CRIMPING BUTTON

The dies will close when this button is pressed. The dies move until the button is released or the set crimping diameter has been reached. When using this button, manual mode must be selected.
When the machine is started with the mode selector in manual mode, crimping cannot be started using the crimping button before first selecting 0-position or opening dies with retraction button 7. Dies will not open if they are already in the set retraction position (signal lamp 8 illuminated).

6. CRIMPING DIAMETER REACHED

The signal lamp is illuminated when the dies have reached the set crimping diameter.

7. RETRACTION BUTTON

The dies will open when this button is pressed. The dies open until the button is released or the set retraction diameter has been reached.
When using this button, manual mode must be selected.

8. RETRACTION DIAMETER REACHED

The signal lamp is illuminated when the dies have reached the set retraction diameter, i.e. retraction position. Automatic mode cannot get started unless the retraction position has been reached.

9. DELAY SIGNAL LAMP

The signal lamp is illuminated when the delay function is active.

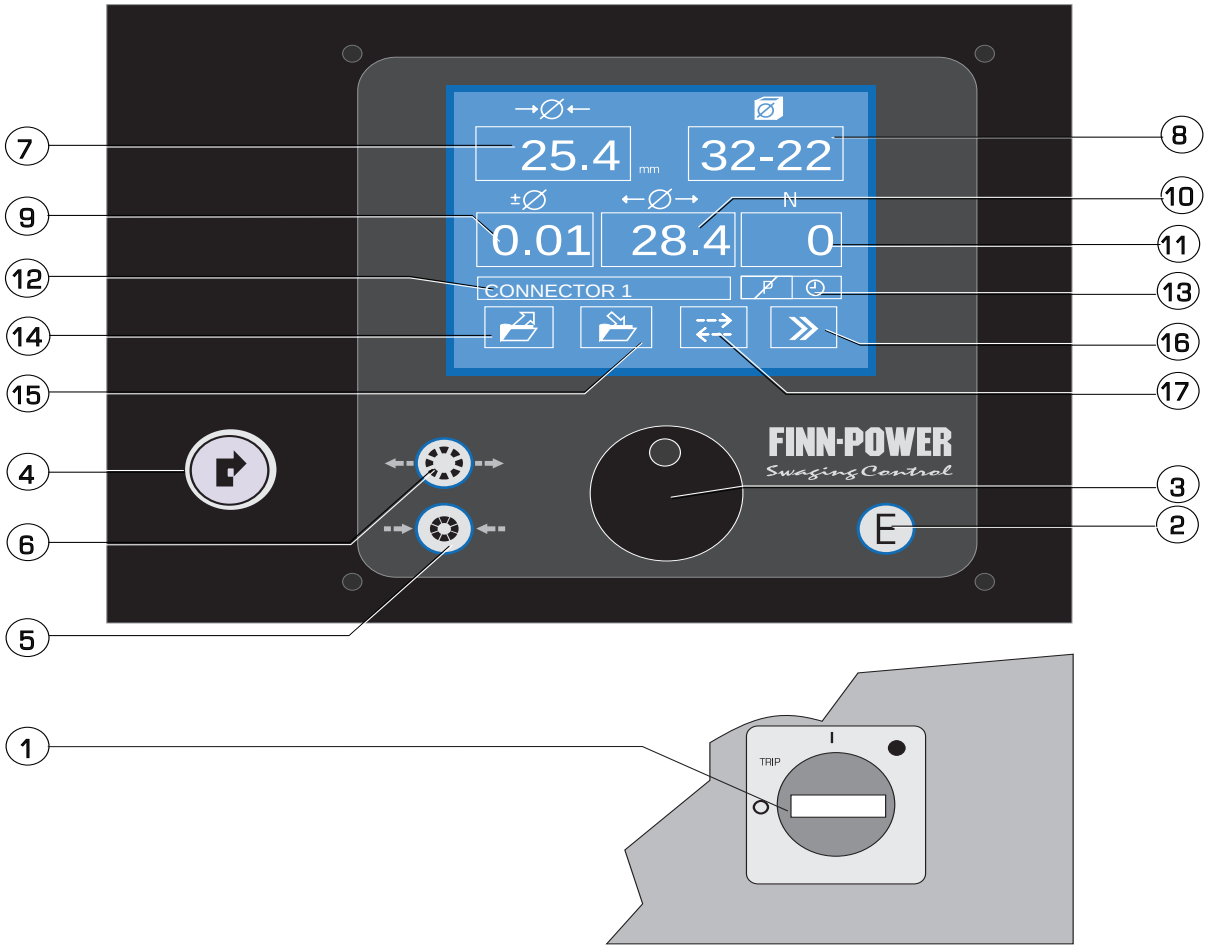
10. RETRACTION DIAMETER CONTROL

The dial is used to adjust the retraction diameter of master dies after the crimping cycle. Adjust the retraction large enough so that the fitting to be crimped is easy to insert between the dies but the "extra" movement is as short as possible. The retraction becomes larger when the dial is turned clockwise.

11. CRIMPING DIAMETER CONTROL

The crimping diameter is defined by means of this vernier dial and the die set that is used. The dial covers 0...10 mm. The measuring scale is divided into divisions of either 0.01 mm or 0.1 mm. The crimping diameter increases when the dial is turned clockwise. If the dial is of multi-turn type, as in IS-models, one turn is equivalent to a 1 mm change in the crimping diameter. In AS-models the diameter changes by 1 mm between two digits.

Control panel VS



P20vs.eps

1. SUPPLY DISCONNECTING DEVICE

The supply disconnecting device starts and stops the motor. It is used to disconnect the machine from power supply. However, the undervoltage trip can be made dead only by disconnecting the plug or supply cable from the mains.
In case of power failure, the motor stops and the handle turns to the so called TRIP position. Restart the machine by turning the handle first to 0-position (reset) and after that to I-position.
In an emergency, the supply disconnecting device is used as an emergency stop.

2. ENTER BUTTON E

3. SELECTOR

All selections and control functions of the VS control are performed by means of the selector and enter button **E**. The desired display adjustable from the selector is selected by turning the selector and activated by pressing **E** button. The display then gets a bold shaded outline and the display value can be modified by turning the selector. The new value comes into force after pressing **E**. The display turns partly shaded again, after which another display can be selected by turning the selector.

4. SEMI-AUTOMATIC CRIMPING

This button starts crimping movement provided that the symbol of semi-automatic crimping  is shown on the mode display.

cycle.wmf

5. CRIMPING BUTTON

The dies will close when this button is pressed. The dies move until the button is released or the set crimping diameter has been reached.
When using this button, manual mode must be selected.

6. RETRACTION BUTTON

The dies will open when this button is pressed. The dies open until the button is released or the set retraction diameter has been reached.
This button can be used either in manual mode or in semi-automatic and foot pedal modes in a situation when you want to open dies in the middle of crimping.

7. CRIMPING DIAMETER

The crimping diameter is defined by selecting a value on this display and by means of the die set that is used. The crimping range extends from the minimum crimping diameter of the smallest die set programmed up to the maximum crimping diameter of the largest die set programmed. It is divided into divisions of 0.1 mm. In addition, the crimping diameter can be modified by correction adjustment.

8. DIE SET

When the crimping diameter is being adjusted, VS control automatically recommends a die set best suited for the selected diameter. If desired, the operator may use another die set covering the diameter in question. Thus he may manage to avoid changing die sets but the crimping result will not be as good as if the recommended die set would have been used.

9. CORRECTION

Different fittings require more or less crimping force. The machine frame design, however contracts and expands according to the required crimping force. That is why the crimping diameter must be corrected in order to reach the intended crimping result. It is recommended to use the correction function in modifying the crimping diameter so that the correct crimping diameter for the fitting in question could be saved on the crimping diameter display for the next time it is needed.

10. RETRACTION DIAMETER

The retraction diameter indicates the opening of master dies after the crimping cycle. Adjust the retraction large enough so that the fitting to be crimped is easy to insert between the dies but the ”extra” movement is as short as possible. The retraction value is the diameter of the opening between the dies in millimetres.

11. CRIMP COUNTER

The counter counts crimps either from zero or from a set value onwards.

12. FITTING TYPE

Crimping data of your own or of the fitting manufacturer can be stored in the memory of the control unit. You can name a fitting type as you like or use fitting types of the fitting manufacturer.

13. PRESSURE SWITCH AND CRIMPING DELAY

Pressure switch function and crimping delay on/off. See VS control, page 9.

14. RECALL OF STORED CRIMPING DATA

The crimping data of a certain fitting type can be recalled from the control unit memory. See VS control, page 6.

15. STORING OF CRIMPING DATA

Crimping data are stored in the memory for the next time to be used. It is worth while naming a fitting type to facilitate finding it again. See VS control, page 8.

16. SETUPS

Set-ups of crimping delay, pressure switch, mm/inch and calibration. See VS control, page 10.

17. MODE SELECTION

See VS control, page 9.

MANUAL : Master dies can be opened by pressing retraction button 6 and closed by pressing crimping button 5. Manual mode is used when changing dies and adjusting settings. Ees-taas.wmf

SEMI-AUTOMATIC : Crimping movement gets started when the semi-automatic button 4 is pressed. The movement can be interrupted by releasing the button. If need be, dies can be opened by using retraction button 6. Crimping goes on when the button is repressed. After reaching the crimping diameter, dies return to the retraction position irrespective of whether the button is pressed or not. Cycle.wmf

AUTOMATIC : Crimping starts when the fitting is pressed against the stop device. The movement stops if the stop device is not adequately pressed by the fitting. It can also be stopped by withdrawing the fitting from the stop device before it is gripped by dies. If need be, dies can be opened by using retraction button 6. Crimping goes on when the fitting is repressed against the stop device. After reaching the crimping diameter, dies return to the retraction position irrespective of whether the fitting is pressed against the stop device or not. Vs-s top.wmf

FOOT PEDAL : Crimping starts when the foot pedal is pressed. The movement can be interrupted by lifting the foot from the pedal. If need be, dies can be opened by using retraction button 6. Crimping goes on when the foot pedal is repressed. After reaching the crimping diameter, dies return to the retraction position irrespective of the position of the foot pedal. Vs-pedal.wmf

TOOL CHANGE : The VS control advises the operator to change the die set. See VS control, page 11.

Covers P32

The rear of the crimping head is covered by a housing protecting the operator from the crimping hazard between rear flange and cylinder.

KEEP THIS COVER HOUSING IN ITS PLACE DURING CRIMPING!

Test run MS/IS/AS controls

- Start the motor.
- Set the crimping diameter dial to 0.0.
- During the first crimping cycles air in the cylinders may make the piston/dies move irregularly and at high speed. Cycle the press a few times till the motion becomes even.
- To avoid accidents, make sure that there are no foreign objects between the dies.
- In case the dies do not move in either direction, the motor rotates in wrong direction. Correct by interchanging two phase conductors in the supply disconnecting device.

Test run VS control

- Start the motor.
- Adjust the crimping diameter to 10.0 and the retraction to the maximum value.
- During the first crimping cycles air in the cylinders may make the piston/dies move irregularly and at high speed. Cycle the press a few times till the motion becomes even.
- To avoid accidents, make sure that there are no foreign objects between the dies.
- In case the dies do not move in either direction, the motor rotates in wrong direction. Correct by interchanging two phase conductors in the supply disconnecting device.
- Test the operation of each button and adjustment in the panel according to Chapter "Control panel". Read throughly through also the VS control operating instructions.

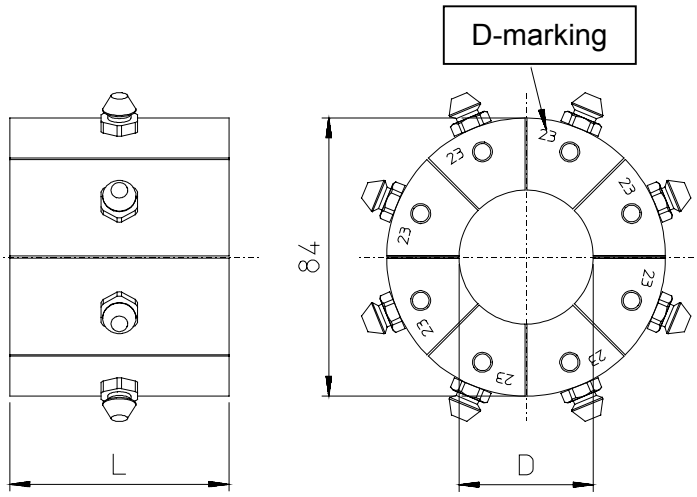
Selecting the die set P20, P21

Use only original Finn-Power die sets in Finn-Power crimping machines.

Refer to the fitting manufacturer's specifications for proper crimping diameter for the fitting.
Each die set has its own crimping range. Follow it to assure the roundest possible crimping result.
The minimum crimping diameter **D** is marked on each die set.

Example: with die set No 18013/10 the minimum crimping diameter is 10 mm.

D	L	Die set No	Crimping range
10	55	18013/10	10...12 mm
12	55	18013/12	12...14 mm
14	55	18013/14	14...16 mm
16	55	18013/16	16...19 mm
19	55	18013/19	19...23 mm
23	55	18013/23	23...27 mm
27	70	18013/27	27...31 mm
31	70	18013/31	31...36 mm
36	75	18013/36	36...41 mm
41	75	18013/41	41...47 mm
47	85	18013/47	47...54 mm
54	85	18013/54	54…61 mm



In addition to the standard die sets, a wide range of special die sets is available on request.

18013ins.eps

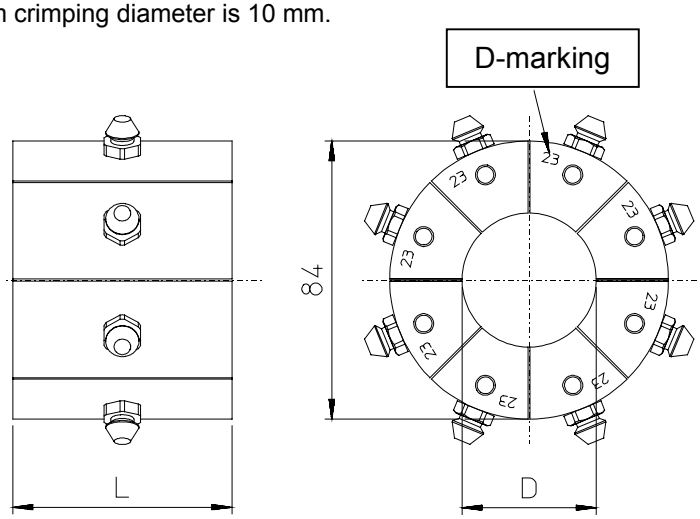
Selecting the die set CC22

Use only original Finn-Power die sets in Finn-Power crimping machines.

Refer to the fitting manufacturer's specifications for proper crimping diameter for the fitting.
Each die set has its own crimping range. Follow it to assure the roundest possible crimping result.
The minimum crimping diameter **D** is marked on each die set.

Example: with die set No 18315/10 the minimum crimping diameter is 10 mm.

D	L	Die set No	Crimping range
10	50	18315/10	10...12 mm
12	50	18315/12	12...14 mm
14	50	18315/14	14...16 mm
16	50	18315/16	16...19 mm
19	50	18315/19	19...23 mm
23	50	18315/23	23...27 mm
27	50	18315/27	27...31 mm
31	50	18315/31	31...36 mm
36	50	18315/36	36...41 mm
41	50	18315/41	41...47 mm
47	50	18315/47	47...54 mm



18013ins.eps

In addition to the standard die sets, a wide range of special die sets is available on request.

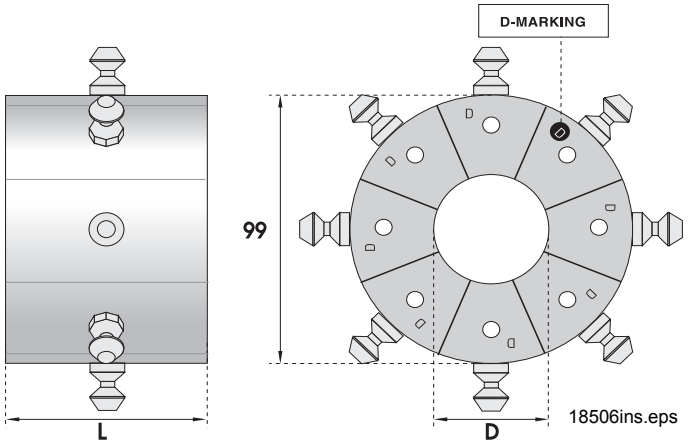
Selecting the die set P32

Use only original Finn-Power die sets in Finn-Power crimping machines.

Refer to the fitting manufacturer's specifications for proper crimping diameter for the fitting.
Each die set has its own crimping range. Follow it to assure the roundest possible crimping result.
The minimum crimping diameter **D** is marked on each die set.

Example: with die set No 18506/10 the minimum crimping diameter is 10 mm.

D	L	Die set No	Crimping range
10	55	18506/10	10 ... 12 mm
12	55	18506/12	12 ... 14 mm
14	55	18506/14	14 ... 16 mm
16	55	18506/16	16 ... 19 mm
19	55	18506/19	19 ... 22 mm
22	70	18506/22	22 ... 26 mm
26	70	18506/26	26 ... 30 mm
30	70	18506/30	30 ... 34 mm
34	75	18506/34	34 ... 39 mm
39	75	18506/39	39 ... 45 mm
45	90	18506/45	45 ... 51 mm
51	90	18506/51	51 ... 57 mm
57	100	18506/57	57 ... 63 mm
63	110	18506/63	63 ... 69 mm
69	110	18506/69	69 ... 75 mm
74	110	18506/74	74 ... 80 mm
78	110	18506/78	78 ... 87 mm



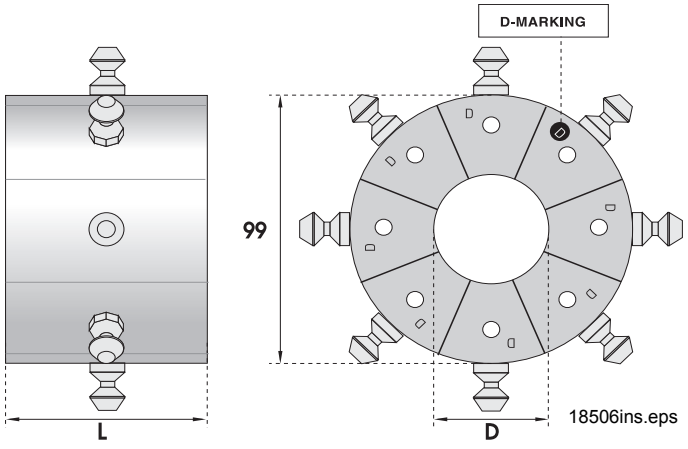
In addition to the standard dies, a wide range of special dies is available on request.

Selecting the die set P51

Use only original Finn-Power die sets in Finn-Power crimping machines.
Refer to the fitting manufacturer's specifications for proper crimping diameter for the fitting.
Each die set has its own crimping range. Follow it to assure the roundest possible crimping result.
For standard die sets, the adapter dies must be installed in the machine's master dies.
The minimum crimping diameter **D** is marked on each die set.

Example: with die set No 18506/10 the minimum crimping diameter is 10 mm.

D	L	Die set No	Crimping range
10	55	18506/10	10 ... 12 mm
12	55	18506/12	12 ... 14 mm
14	55	18506/14	14 ... 16 mm
16	55	18506/16	16 ... 19 mm
19	55	18506/19	19 ... 22 mm
22	70	18506/22	22 ... 26 mm
26	70	18506/26	26 ... 30 mm
30	70	18506/30	30 ... 34 mm
34	75	18506/34	34 ... 39 mm
39	75	18506/39	39 ... 45 mm
45	90	18506/45	45 ... 51 mm
51	90	18506/51	51 ... 57 mm
57	100	18506/57	57 ... 63 mm
63	110	18506/63	63 ... 69 mm
69	110	18506/69	69 ... 75 mm
74	110	18506/74	74 ... 80 mm
78	110	18506/78	78 ... 84 mm



P51 -model: see chapter ”operation limitations”.

FP140 DIE SETS FOR P51 -MODEL

FP140 die sets for large fittings are attached directly to the master dies. FP140 die sets are manufactured with following dimensions:

D	L	Die set No	Crimping range
84	110	18860/84	84 ... 92 mm
92	110	18860/92	92 ... 100 mm
100	110	18860/100	100 ... 108 mm
108	110	18860/108	108 ... 116 mm
116	110	18860/116	116 ... 124 mm

In addition to the standard die sets and FP140 die sets, a wide range of special die sets are available on request.

Installing the die set

QUICK CHANGE MS/IS/AS
(OPTION)

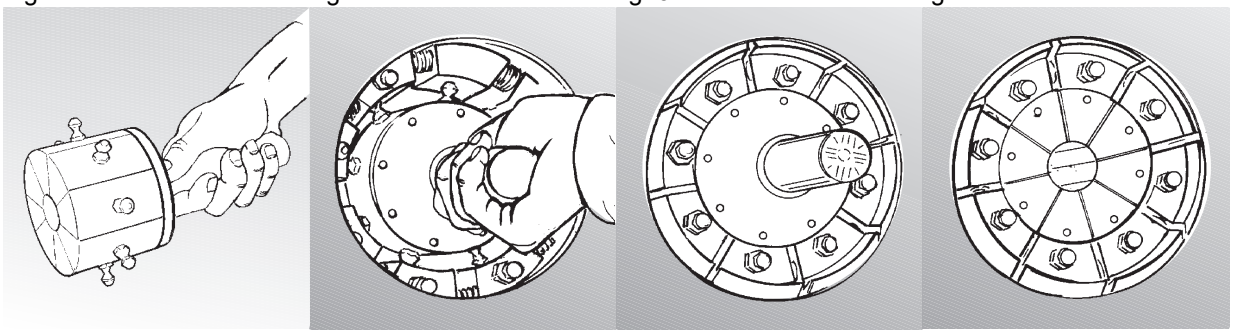
An optional Quick Change Tool Base enables storing die sets under the machine. Die sets can be installed into the master dies with a quick change tool one set at a time.

- Before installing dies, make sure that the master dies are clean.
- **STOP THE MOTOR PRIOR TO CLEANING DIES**.
- IS/AS –models: After that, start the motor, select manual mode and open the dies to maximum retraction.
- Insert the pins of the tool into the die set in the die table, turn the tool clockwise and pull the whole set out (Fig. 1, next page).
- Hold the handle of the quick change tool as shown in figures 1 and 2, and make sure your hand will not get between the dies.
- Mount the die set between master dies (Fig. 2) and start closing the dies.

  TO AVOID DAMAGING MASTER DIES, MAKE SURE THAT ALL DIE SET PINS HIT IN THEIR HOLES.

- Close the master dies completely until the pins are locked in their places (Fig. 3). Remove the tool. The dies are now ready for use (Fig. 4).
- Die set is removed from the master dies in reverse order: close the dies, insert the tool into the die set, open the master dies and place the set back in the die table.

Fig. 1 Fig. 2 Fig. 3 Fig. 4



QC-homma.eps

QUICK CHANGE VS

(OPTION)

An optional Quick Change Tool Base enables storing die sets under the machine. Die sets can be installed into the master dies with a quick change tool one set at a time.

- Before installing dies, make sure that the master dies are clean**.**
- **STOP THE MOTOR PRIOR TO CLEANING DIES.**
- Select TOOL CHANGE MODE.
- See also VS control, Chapter "Tool change screen" on page 11.
- Open the dies to maximum retraction.
- Insert the pins of the tool into the die set in the die table, turn the tool clockwise and pull the whole set out (Fig. 1).
- Hold the handle of the quick change tool as shown in figures 1 and 2, and make sure your hand will not get between the dies.
- Mount the die set between master dies (Fig. 2) and start closing the dies.

TO AVOID DAMAGING MASTER DIES, MAKE SURE THAT ALL DIE SET PINS HIT IN THEIR HOLES.

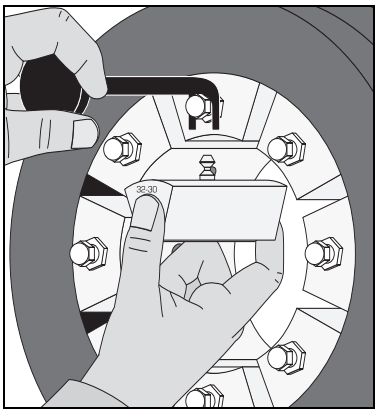
- Close the master dies completely until the pins are locked in their places (Fig. 3).
- Remove the tool (Fig. 4). Open the dies to the retraction position. The dies are now ready for use.
- Die set is removed from the press in reverse order: close the dies, insert the tool into the die set, open the master dies and place the set back in the table.

CHANGE OF A SINGLE DIE P20, P21, P32, CC22

- Start the motor and depress the retraction button until maximum retraction is reached. Stop the motor.

  CAUTION ! THE MOTOR SHALL ALWAYS BE STOPPED DURING INSTALLATION OF DIES.

- Prior to installing dies, clean the contact surfaces of both the die set and master dies properly to avoid damaging the surfaces.
- Pull the pull pin in the master die with the tool delivered together with the machine (see figure).
- Insert the die with the retaining pin into the master die, die number always towards you. Release the pull pin.
- After installing all the dies, make sure they are straight and properly seated in the master dies.



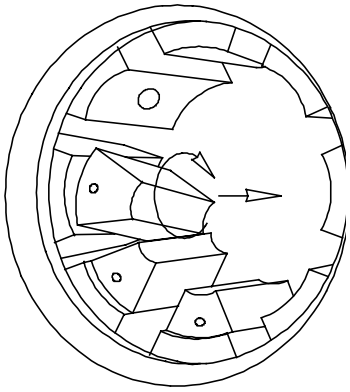
Fork20.eps

CHANGE OF A SINGLE DIE P51

- Start the motor and depress the retraction button until maximum retraction is reached. Stop the motor.

CAUTION ! THE MOTOR SHALL ALWAYS BE STOPPED DURING INSTALLATION OF DIES.

- Prior to installing dies, clean the contact surfaces of both the die set and master dies properly to avoid damaging the surfaces.
- Insert the die with the die set pin into the master die, die number always towards you.
- After installing all the dies, make sure they are straight and properly seated in the master dies.
- Remove the die by turning it round the die set pin and pulling it parallel to the die set pin, so that the die set pin comes out of the hole.



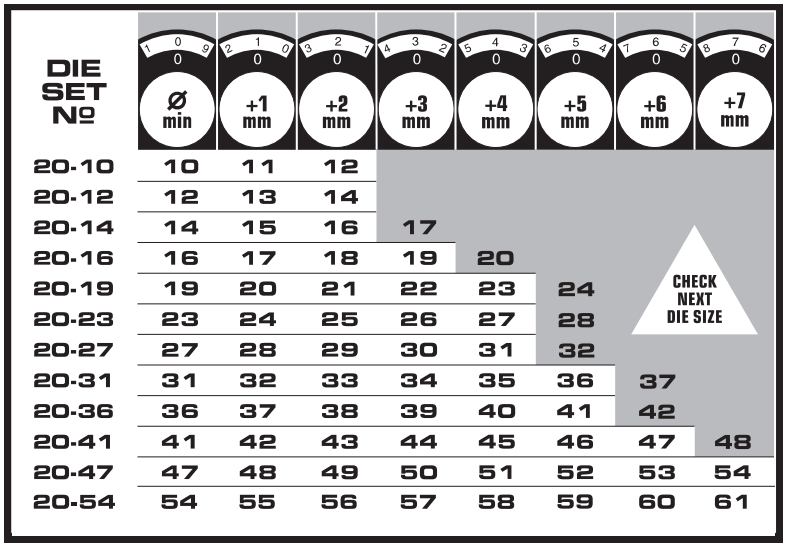
P50leva.hgl

Setting the crimping diameter MS

From the crimping diameter chart on the electric box door you can see the die set numbers and the corresponding crimping ranges. The upper section of the chart shows the corresponding dial position for each crimping diameter in the columns.

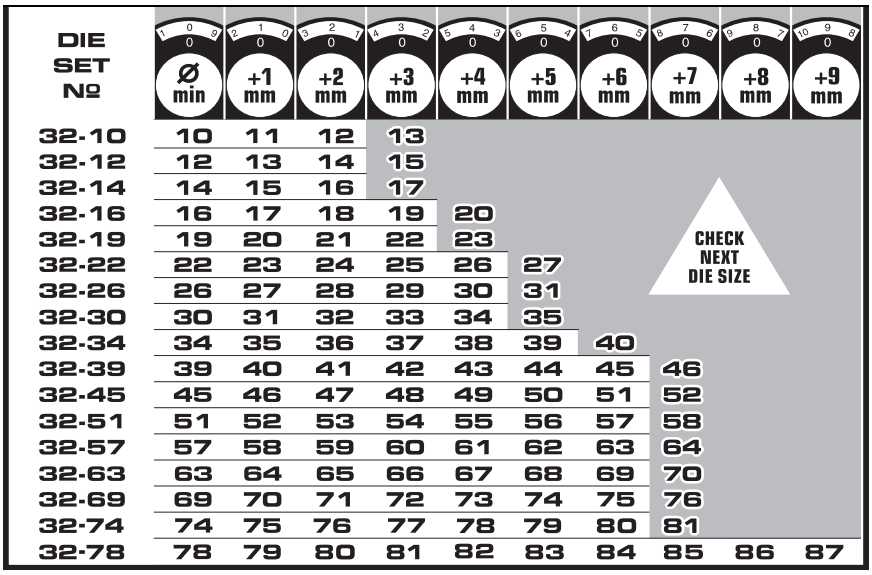
Crimping diameters in the grey zone of the chart are not recommended.

The crimping diameter dial has been calibrated at the factory so that when the dial is set at 0.0, the resulting diameter will be the minimum diameter of the die set installed, i.e. with die set No 20-16 the crimping diameter will be 16 mm, No 20-19 gives a diameter of 19 mm etc. Each full turn clockwise of the adjusting knob of the dial will add 1 mm to the crimping diameter. Each division on the measuring scale corresponds to 1/100 mm.



20chart_MS_new.eps

The crimping diameter chart P20 MS



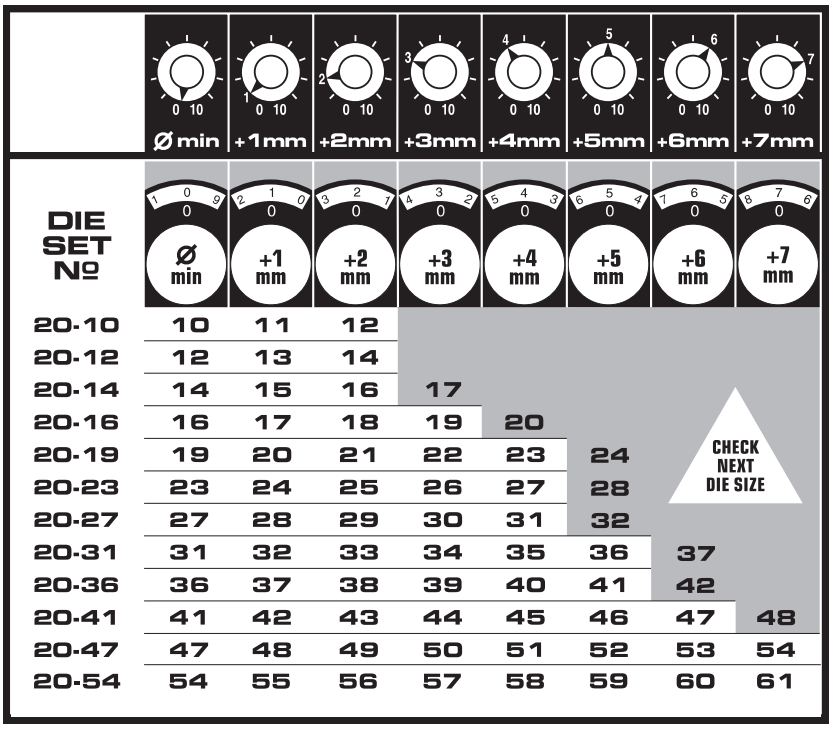
The crimping diameter chart P32 MS

EXAMPLE:
Manufacturer has specified a crimping diameter of 20.6 mm for the fitting. Select die set No 20-19 (min crimping diameter 19 mm) according to the die chart. Turn the dial to position 1.60 (upper scale 1, lower 60). This setting will give the crimping diameter 20.6 mm (19 + 1.6 mm).

The machine has been calibrated at the factory with 40 bar pressure. This means that when you are crimping a fitting requiring 40 bar pressure, the measuring scale of the crimping diameter dial provides an accuracy of +/- 0.1 mm (possible elastic recovery of the fitting not regarded).

When fittings requiring higher pressure are crimped, the crimping diameter may become larger than the value on the scale due to machine deflections. Then the crimping diameter has to be corrected by changing the scale value.

Setting the crimping diameter IS/AS



20chart_IS_AS_new.eps

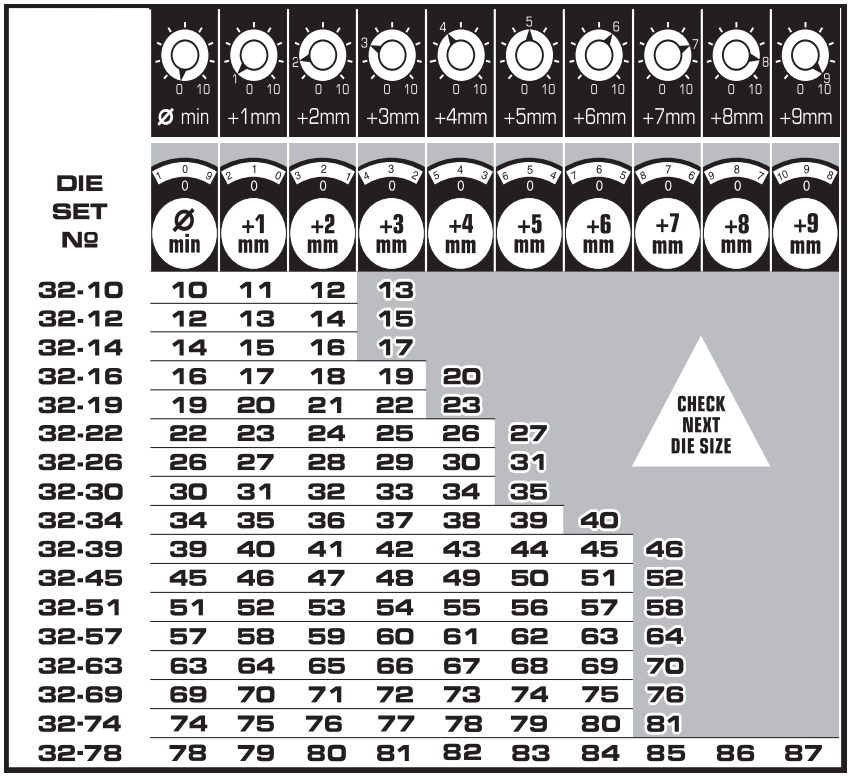
The crimping diameter chart P20 / P21 / CC22

From the crimping diameter chart on the electric box door you can see the die set numbers and the corresponding crimping ranges. The upper section of the chart shows the corresponding dial position for each crimping diameter in the columns. The upper dial positions are for AS and lower for IS-models.
Crimping diameters in the grey zone of the chart are not recommended.

The crimping diameter dial has been calibrated at the factory so that when the dial is set at 0.0, the resulting diameter will be the minimum diameter of the die set installed, i.e. with die set No 20-16 the crimping diameter will be 16 mm, No 20-19 gives a diameter of 19 mm etc.

The crimping diameter increases when the dial is turned clockwise. In IS-models one turn is equivalent to a 1 mm change in the crimping diameter. In AS-models the diameter change is 1 mm between two digits. The measuring scale of the dial is divided into divisions of either 0.01 mm in IS-models or 0.1 mm in AS-models.

EXAMPLE: The crimping diameter of the fitting should be 20.6 mm. Select die set No 20-19 (min crimping diameter 19 mm) according to the die chart. Turn the IS-dial to position 1.60 (upper scale 1, lower 60). The AS-dial is turned to position 1.6. This setting will give the crimping diameter 20.6 mm (19 + 1.6 mm).



32chart.eps

The crimping diameter chart P32 / P51

The machine has been calibrated at the factory with 40 bar pressure. This means that when you are crimping a fitting requiring 40 bar pressure, the measuring scale of the crimping diameter dial provides an accuracy of +/- 0.1 mm (possible elastic recovery of the fitting not regarded). When fittings requiring higher pressure are crimped, the crimping diameter may become larger than the value on the scale due to machine deflections. Then the crimping diameter has to be corrected by changing the scale value.

Setting the crimping diameter VS

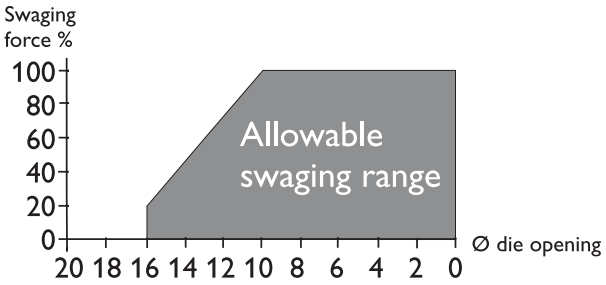
- While the crimping diameter display is surrounded by the cursor, activate it by pressing **E**.
- Select the desired crimping diameter by turning the selector and press **E**.
- Check the die set used and change it if need be.
- When required, set the retraction diameter in the same way.

The machine has been calibrated at the factory with 40 bar pressure. This means that when you are crimping a fitting requiring 40 bar pressure, the measuring scale of the crimping diameter dial provides an accuracy of +/- 0.1 mm (possible elastic recovery of the fitting not regarded).

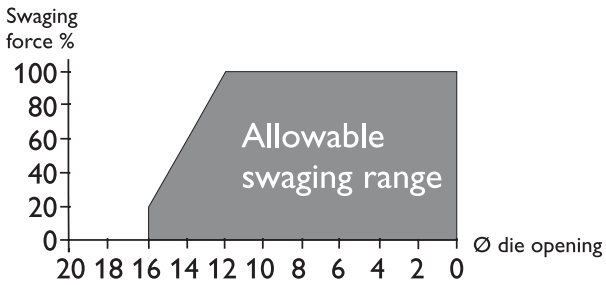
When fittings requiring higher pressure are crimped, the crimping diameter may become larger than the value on the scale due to machine deflections. Then the crimping diameter has to be corrected using the correction function.

Operation limitations P51, CC22

- The sheerer cone in the master die and piston is not meant for crimping but only for achieving a larger opening.
- The allowable crimping range is shown in the figure.
- Insert the fitting between the dies from the front side of the machine to enable crimping between the back of the dies. Insert also large fittings (that are as long as dies) from the front side, in which case the front part of the fitting is settled between the back of the dies.



Allowable crimping range for the CC22 machine.



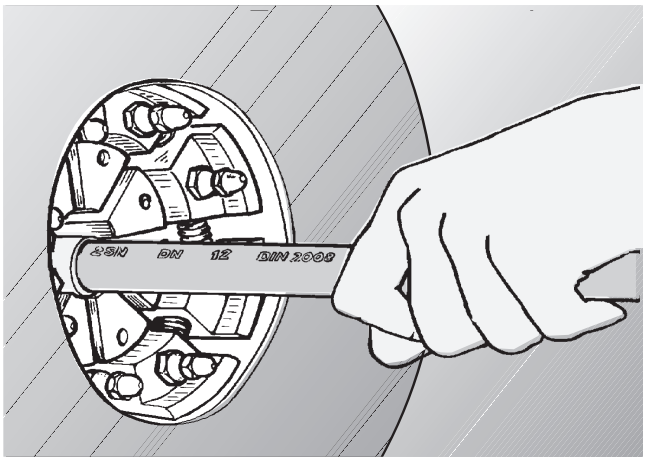
Allowable crimping range for the P51 machine.

Crimping MS -control

WHEN CRIMPING A FITTING, HOLD THE HOSE FAR ENOUGH TO AVOID CRIMPING YOUR HAND !

- After installing the proper die set and adjusting the crimping diameter, insert the hose and fitting between the dies.
- Depress and hold down the crimping push-button until the preset diameter has been reached.
- The crimping movement stops automatically and light goes on in the crimping push-button.
- Depress the retraction button and take the crimped assembly out.
- Check the result and measure the diameter. If necessary, correct the scale value and crimp again.

To enable faster crimping and reliable results in the future, make a chart of the diverse hose/fitting combinations and the corresponding die sets and dial adjustment values.



Keephose.eps

Crimping IS/AS/VS -controls

WHEN CRIMPING A FITTING, HOLD THE HOSE FAR ENOUGH TO AVOID CRIMPING YOUR HAND !

MANUAL MODE ees-taas.wmf

Manual mode is used during die set change, set-up and test run.

1. Select MANUAL MODE.
1. Press the start button.
2. Adjust the recommended crimping diameter.
3. P51 and CC22 –models: Always insert the hose from the front side so that the fitting settles in the rear part of the die (see figure below).
4. Press the crimping button until the dies hold the fitting lightly.
5. Adjust the retraction diameter when required.
6. Press the crimping button until the dies stop.
7. Open the dies and remove the fitting.
8. Check the crimping diameter.
9. If necessary, perform fine adjustment using the correction function (VS model) / with the crimping diameter dial (IS/AS models).

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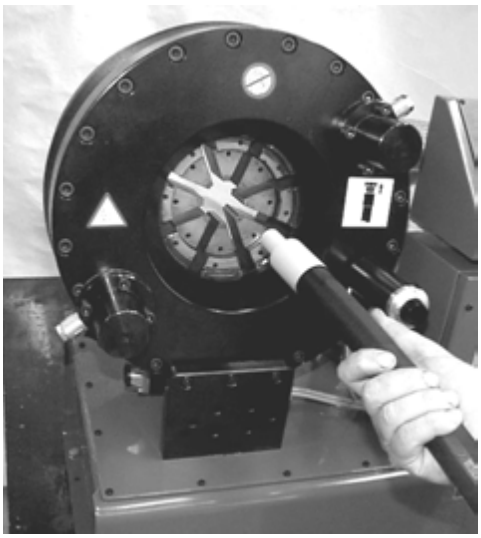

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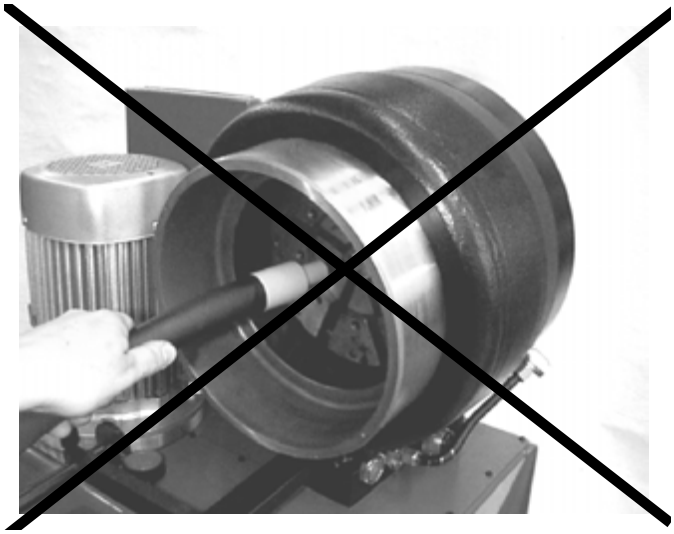


Crimping direction in P51 and CC22 -models.

SEMI-AUTOMATIC MODE cycle.wmf

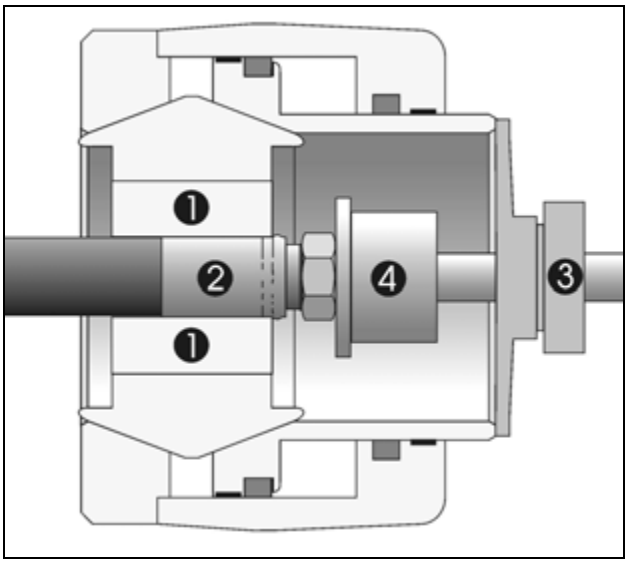
Semi-automatic mode is used when performing small quantities of crimps.

1. Adjust the crimping and retraction diameters.
2. Select SEMI-AUTOMATIC MODE.
3. Insert the hose assembly between the dies.
4. Press the semi-automatic crimping button, and dies perform a crimping-retraction cycle. The cycle can be interrupted by releasing the button. If need be, dies can be opened by using the retraction button.

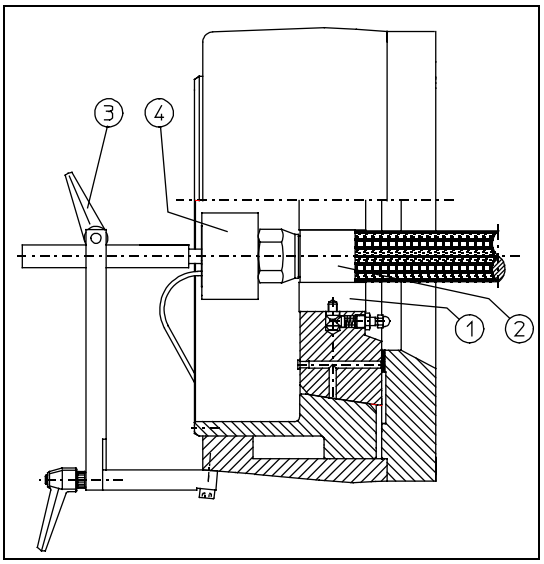
AUTOMATIC MODE AUTO **IS/AS** **VS** Autopress/VSstop.eps

Automatic mode is best suited for serial production. Pressing the fitting against the stop device starts the crimping movement.

1. Select MANUAL MODE.
2. Set the required crimping diameter.
3. Insert the fitting (2) between the dies (1) to the correct position as shown in the figure.
4. Crimp the dies lightly until they hold the fitting properly.



P20, P21 and P32 -models



CC22 and P51 -models

5. P20, P21 and P32 –models: Loosen the locking nut (3) and push the stop device (4) against the fitting so that the spring-loaded stop device is compressed, making the limit switch inside it actuate. Tighten the locking nut.
   CC22 and P51 –models: Loosen the locking lever (3) and push the stop device (4) against the fitting so that the spring-loaded stop device is compressed, making the limit switch inside it actuate. Tighten the locking lever.
6. Open the dies until the fitting loosens.
7. Select AUTOMATIC MODE.
8. When the stop device is pressed, the machine performs a crimp and returns to the set retraction.
9. The movement stops if the fitting is not adequately pressed against the stop device. If need be, dies can be opened by using the retraction button.
10. After dies have gripped the fitting, the crimping movement can be stopped only by the emergency stop push-button.
11. Make sure that there are no foreign objects between the dies.
12. Make a test crimp by pressing the fitting against the stop device.
13. Check the crimping diameter and correct the position of the stop device if necessary.

To protect your hands from getting crimped, don't ever touch the stop device !

AUTOMATIC MODE / FOOT PEDAL **IS/AS** **VS** foot-pdl.wmf//VS-pedal.wmf
(OPTION)

As an alternative, a foot pedal can be installed in the stop device plug, e.g. when large fittings are crimped and more space is needed behind the machine. The foot pedal enables holding the hose assembly with both hands.
In FOOT PEDAL mode dies will move as long as the pedal is pressed or till the set crimping diameter has been reached. The crimping movement can be interrupted by lifting the foot from the pedal. If need be, dies can be opened by using the retraction button.

Adjustment of retraction diameter IS/AS

1. Turn the mode selector to 0-position.
2. Start the machine by pressing the start button.
3. Select manual mode.
4. Press the crimping button until the dies completely close.
5. Turn the retraction diameter control dial counterclockwise up to the minimum.
6. Select semi-automatic mode.
7. Turn the retraction diameter control dial gradually clockwise. While the dial is turned, the dies will open. Insert the uncrimped fitting between the dies as soon as the opening is large enough. Release the retraction diameter control dial at that position, which then becomes the final setting.

If the machine does not work...

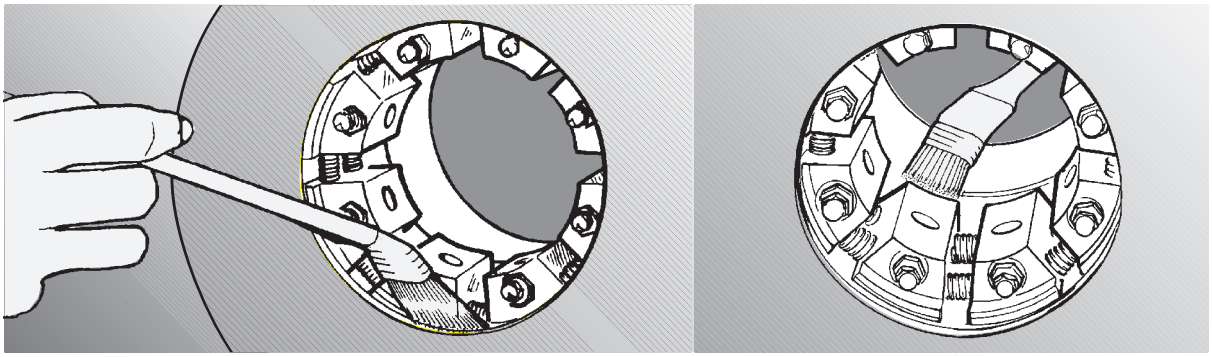
- Make sure the supply disconnecting device is in position 1.
- Check that the plug is in the socket.
- MS –model: If the motor is running but the machine does not crimp, check that the crimping diameter dial is plugged in.
- IS/AS –models: In automatic modes the dies must be in the retraction position (signal lamp 8 illuminated), otherwise the crimping cycle will not get started.
- VS –model: If the motor is running but the machine does not crimp, check that the crimping diameter dial is plugged in.
- If still not working, contact a serviceman.

PREVENTIVE MAINTENANCE

- The following maintenance operations can be performed by the operator according to the instructions below. However, electrical works and repairs like changing seals or the pump must only be carried out by a qualified specialist.
- **PRIOR TO ANY SERVICING OPERATION, TURN THE SUPPLY DISCONNECTING DEVICE TO POSITION '0'.**
- **BEFORE CHANGING THE MOTOR CIRCUIT BREAKER OR UNDERVOLTAGE TRIP, DISCONNECT THE PLUG OR SUPPLY CABLE FROM THE MAINS !**
- Open the dies to maximum retraction before servicing.

Greasing P20, P21, P32

Greas_32.eps



- Lubricate the inner surface of the conical flanges daily with pressure-proof grease like Molub Alloy OG-H or equivalent.
- Apply the grease to the conical surfaces at the front and back of the die with a small brush.
- Lubricate often with a small amount of grease rather than seldom with much grease.
- Do not grease the piston rod.

Greasing P51

- Set the crimping diameter dial at 0.0.
- Close the dies and stop the motor.
- Lubricate the master dies daily with pressure-proof grease like Molub Alloy OG-H or equivalent.
- Lubricate the master dies through 16 grease nipples using a compressor gun (alike as CC22 greasing).
- Apply the grease to **the conical surface at the back of the die** with a small brush (alike as CC22).
- Lubricate often with a small amount of grease rather than seldom with much grease.
- Do not grease the piston rod.

Greasing CC22

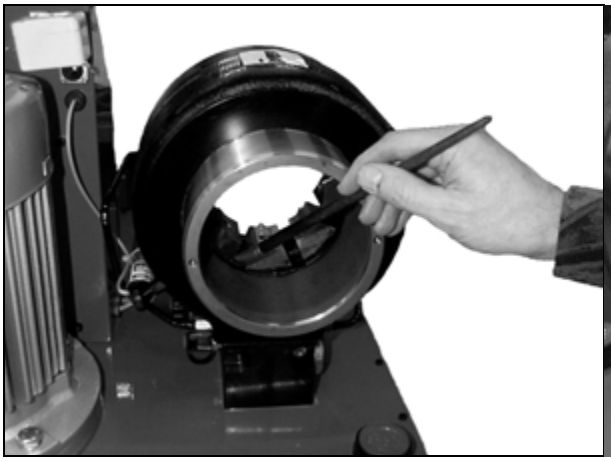


Fig. 1

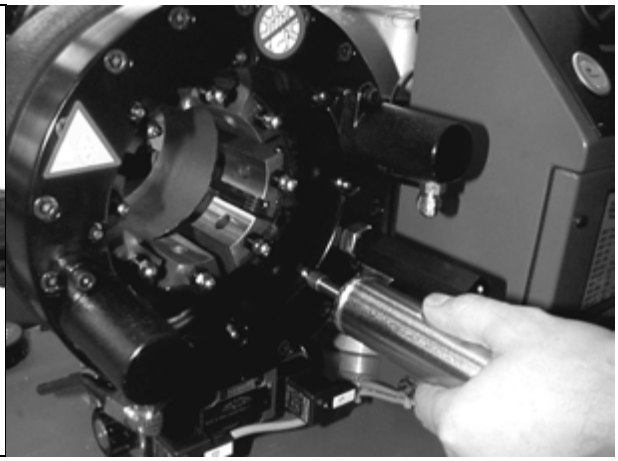
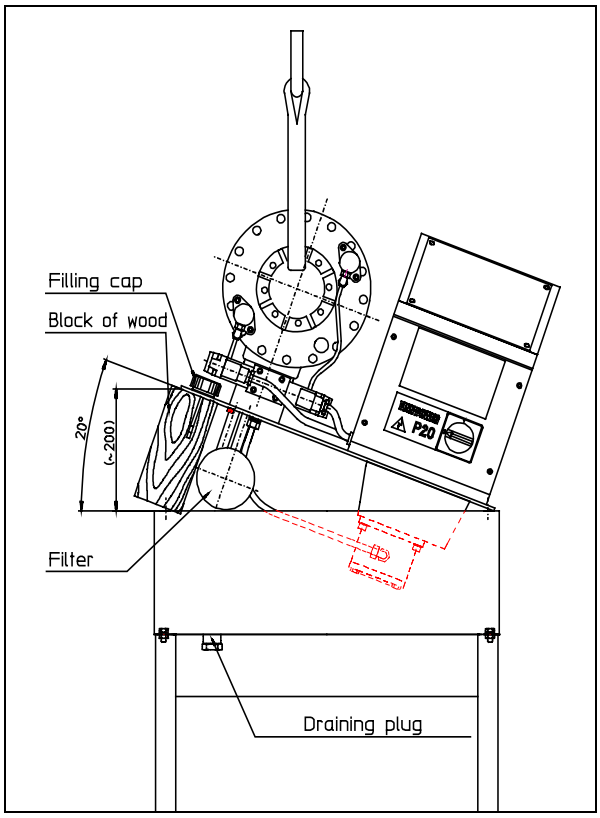


Fig. 2

- Open the dies to maximum retraction.
- Lubricate the surfaces daily with pressure-proof grease like Molub Alloy OG-H or equivalent.
- Lubricate **the front side of the die** through the grease nipples using a compressor gun (see fig. 2).
- Apply the grease to **the conical surface at the back of the die** with a small brush (see fig. 1).
- Lubricate often with a small amount of grease rather than seldom with much grease.
- Do not grease the piston rod.

Oil change

- Empty the tank of oil through the draining plug under the tank.
- Handle the waste oil according to law.
- Fill the tank to centre line of the indicators in the dipstick of the filling cap.
- Oil tank volume: 32 litres (P51: 50 litres).
- Recommended oil: Shell Tellus T46 or equivalent.
- Change hydraulic oil after the first 500 hours of operation and every 1000 hours thereafter.
- It is recommended to pump the oil into the tank through a 20 µ filter, because new oil in drums is not pure.
- If any oil has run out on the floor, wipe it away.



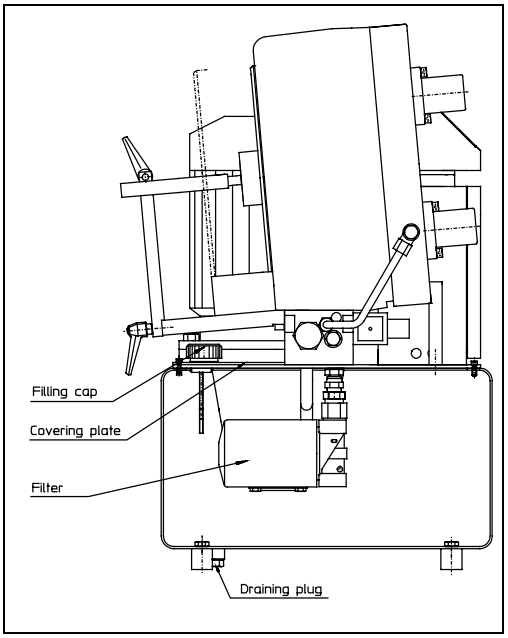
P20suode.hgl

Filter change P20, P21, P32, CC22

- Open the tank cover as shown in the figure.
- Keep the cover open by using e.g. a block of wood.
- Unscrew the filter insert and remove it.
- Handle the old filter according to law.
- Lubricate the seal of the new filter insert with hydraulic oil.
- Screw the filter insert on.
- Filter insert must be changed together with oil.
- Purchase number: 043167.

Filter change P51

- Open the covering plate in the tank cover.
- Unscrew the filter insert and remove it.
- Handle the old filter according to law.
- Lubricate the seal of the new filter insert with hydraulic oil.
- Screw the filter insert on.
- Filter insert must be changed together with oil.
- Purchase number: 043167.



P50suod.hgl

Pressure pipes

Return cylinders on both sides of the crimping head produce the piston movement backwards and simultaneous retraction of dies.
Hydraulic pipes to the two cylinders are high-pressure pipes (275 bar). To prevent leakage, be careful not to damage these pipes and their connectors.
In case you notice leakage in a connector, make sure it is properly tightened. Leaking pipes must be replaced immediately. DO NOT REPAIR PIPES !

Final deceleration P51

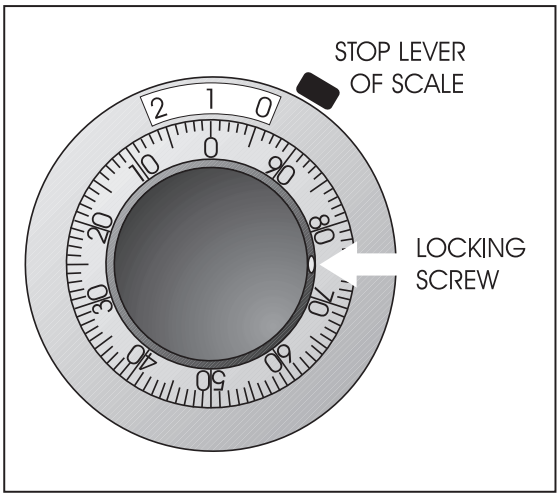
To improve the crimping result, model P 51 are equipped with a slow down of 1...2 mm at the end of the crimp. The slow down has been set at the factory and cannot be altered by the operator.

The slow down is activated either 1...2 mm before the set crimping diameter or at a pressure of approx 100 bar, depending on which one is reached first. The deceleration function is fully automatic.

Re-calibration of crimping diameter dial MS -control

NOTE: The crimping diameter dial has been calibrated at the factory during test run.

1. Re-calibrate the crimping diameter with ferrule (seamless steel tube), Ø 25 mm; wall 2 mm, by using the die set No 20-19 (P20, P21, CC22) or the die set 32-19 (P32, P51).
2. Set the dial at 1.0, so that the crimping diameter will be 20 mm (see the adjacent picture) and lock the dial. Crimp the ferrule and measure the real diameter.
3. Remove the control dial (avoid to turn the dial shaft at the same time).
4. Open the dial lock and set the real diameter into it (diameter of ferrule) relock it and install back.
5. Turn the dial to right diameter and crimp another ferrule. Now the machine has been calibrated and the real diameter should be the same than the diameter which state on the dial. If not, repeat from point 2 and be more careful when handling the dial.
6. After the adjustment, the crimping result should be the minimum nominal crimping diameter of each die set with the dial at 0.0.



10-turn uusi.eps

TROUBLESHOOTING

Troubleshooting is to be carried out by a serviceman.

TROUBLE	POSSIBLE CAUSE	ACTION
Machine will not start.	1. No electric supply	Check fuses and supply cable connections.
	2. Motor protection tripped	Reset. If tripped again, check motor and pump condition.
	3. Switch broken	Check the voltage up to the motor.
	4. Low supply voltage	Check the voltage.
Motor runs but no piston movement.	1. Wrong rotation direction	Interchange two phases in the supply disconnecting device.
	2. Low oil level	Check, refill.
	3. Fuses/rectifier/ transformer out of order	Check, replace.
	4. Dial broken (MS)	Check, replace.
	5. Control broken (IS/AS/VS)	IS/AS -models: Check, replace. VS -model: See error code of the control unit.
	6. Valve out of order	Check movability of valve steam. Check the solenoids.
	7. Pump or coupling broken	Check, replace.
Insufficient crimping force.	1. Insufficient lubrication	Lubricate the dies.
	2. Low oil level	Check, refill.
	3. Pressure relief valve stuck	Check, clean.
	Pilot check valve leaking	Replace if broken.
	4. Leaking pump/pressure pipe	Check, tighten, replace.
	5. Coupling between motor and pump slipping	Check, replace.
Crimping diameter varies.	1. Insufficient lubrication	Lubricate the dies.
	2. Set value changed	Check.
	3. Dial knob loose (MS)	Check, calibrate, tighten
	4. Dial loose (IS/AS)	Check, calibrate, tighten.
	5. Dial loose or broken (MS)	Check, tighten, replace
	6. Sliding potentiometer loose or broken (IS/AS/VS)	Check, fasten, replace.
	7. Valve sticking	Check, clean.

In VS-model, see also VS control, Chapter ”Alarm screen” on page 14.

GUARANTEE

The machines produced by Lillbacka Powerco Oy are guaranteed against defects in material and manufacture. Within the limits of the guarantee, the defective part will be replaced with a new one, or when possible, repaired free of charge.

The guarantee is valid for 12 months after commissioning, yet for a period not exceeding 18 months after delivery ex works Alahärmä, Finland.

The guarantee does not compensate for damage due to improper use, overload, neglect, or normal wear. Working and travelling costs as well as freight charges caused by guarantee repairs are not covered by the guarantee.

Guarantee repairs shall be carried out at Lillbacka Powerco Oy, Alahärmä, Finland, or by an authorized Finn-Power service. In case guarantee repair is demanded, the customer has to prove that the machine is under guarantee.

LILLBACKA POWERCO OY DO NOT WARRANT FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGAES, OR FOR ANY OTHER LOSS, DAMAGE OR EXPENSE OF ANY KIND, INCLUDING LOSS OF PROFITS.

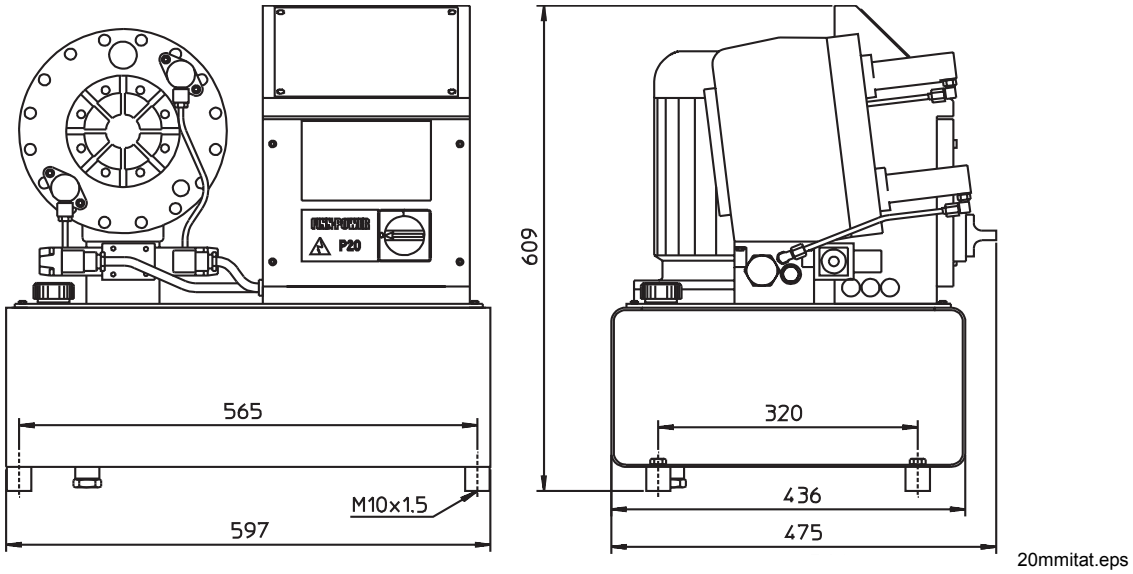
TECHNICAL DATA

Technical data P20

		3-phase	1-phase
Capacity	in	1 ½	1 ½
Crimping diameter range *)	Ø (mm)	4...61	4...61
Max opening	mm	25	25
Pump	l/min	8	2.8
Max pressure	bar	275	275
Crimping force	kN	1370	1370
Theoretical production capacity	per hour	850	250
Sound pressure level	dB(A)	71	71
Enclosure class		IP 54	IP 54
Closing speed of master dies	mm/s	2.5	1
		Frequency 50 Hz	
Motor power	kW	3	1.5
Voltage V / Current A / Fuse A		□ 200 / 16 / 25	□ 230/ 12.6 / 16
		□ 230 / 11.7 / 20	□ / /
		□ 400 / 6.7 / 16	
		□ / /	
		Frequency 60 Hz	
Motor power	kW	3.6	1.5
Voltage V / Current A / Fuse A		□ 210 / 15.6 / 25	□ 230 / 12.5 / 16
		□ 230 / 10.8 / 20	□ / /
		□ 400 / 6.2 / 16	
		□ / /	

*) Special diameters and profiles to customer's specifications.

Overall dimensions:



20mmitat.eps

Weight 130 kg, excluding oil.

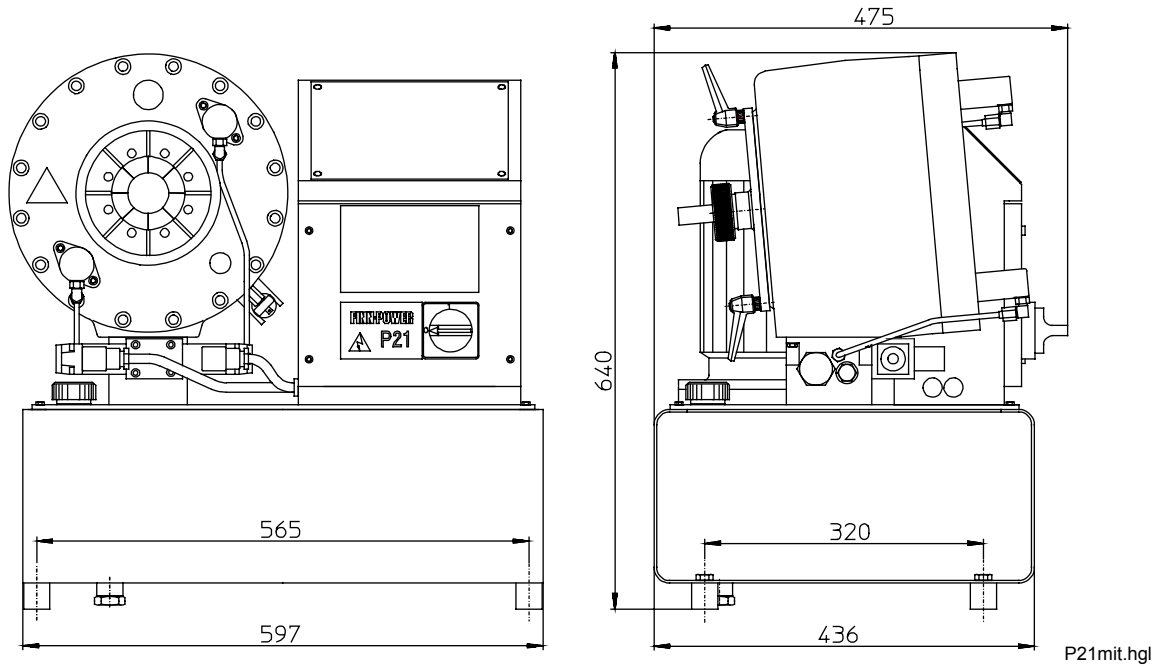
READ THE INSTRUCTIONS THOROUGHLY TO SECURE SAFE AND CORRECT OPERATION OF THE MACHINE.

Technical data P21

		3-phase	1-phase
Capacity	in	1 ½	1 ½
Crimping diameter range *)	Ø (mm)	4...61	4...61
Max opening	mm	34	34
Pump	l/min	8	2.8
Max pressure	bar	275	275
Crimping force	kN	1370	1370
Theoretical production capacity	per hour	850	250
Sound pressure level	dB(A)	71	71
Enclosure class		IP 54	IP 54
Closing speed of master dies	mm/s	2.5	1
		Frequency 50 Hz	
Motor power	kW	3	1.5
Voltage V / Current A / Fuse A		□ 200 / 16 / 25	□ 230/ 12.6 / 16
		□ 230 / 11.7 / 20	□ / /
		□ 400 / 6.7 / 16	
		□ / /	
		Frequency 60 Hz	
Motor power	kW	3.6	1.5
Voltage V / Current A / Fuse A		□ 210 / 15.6 / 25	□ 230 / 12.5 / 16
		□ 230 / 10.8 / 20	□ / /
		□ 400 / 6.2 / 16	
		□ / /	

*) Special diameters and profiles to customer's specifications.

Overall dimensions:



P21mit.hgl

Weight 186 kg, excluding oil.

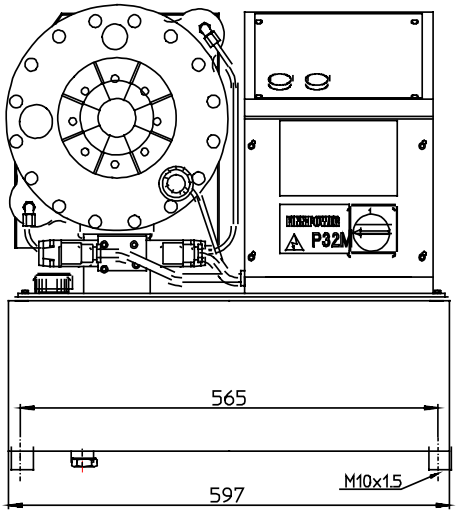
READ THE INSTRUCTIONS THOROUGHLY TO SECURE SAFE AND CORRECT OPERATION OF THE MACHINE.

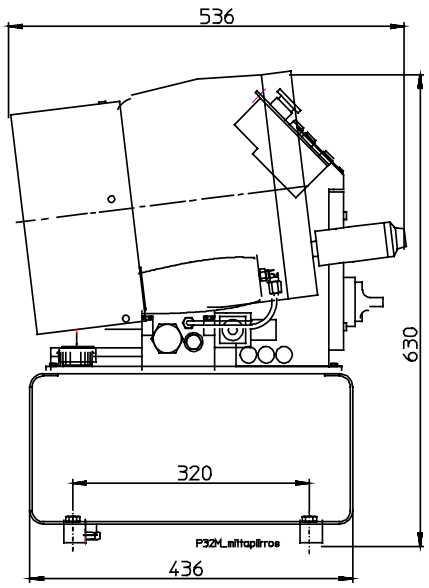
Technical data P32

		3-phase	1-phase
Capacity	in	2	2
Crimping diameter range *)	Ø (mm)	4...87	4...87
Max opening	mm	33	33
Pump	l/min	12	2.8
Max pressure	bar	275	275
Crimping force	kN	2000	2000
Theoretical production capacity	per hour	850	200
Sound pressure level	dB(A)	71	71
Enclosure class		IP 54	IP 54
Closing speed of master dies	mm/s	2.7	0.6
		Frequency 50 Hz	
Motor power	kW	4	1.5
Voltage V / Current A / Fuse A		□ 200 / 20.5 / 35	□ 230/12.6 / 16
		□ 230 / 15.5 / 25	□ / /
		□ 400 / 8.6 / 20	
		□ / /	
		Frequency 60 Hz	
Motor power	kW	4.8	1.5
Voltage V / Current A / Fuse A		□ 210 / 20.2 / 35	□ 230 / 12.5 / 16
		□ 230 / 15.2 / 25	□ / /
		□ 400 / 8.2 / 20	
		□ / /	

*) Special diameters and profiles to customer's specifications.

Overall dimensions:





Weight 178 kg,excluding oil.

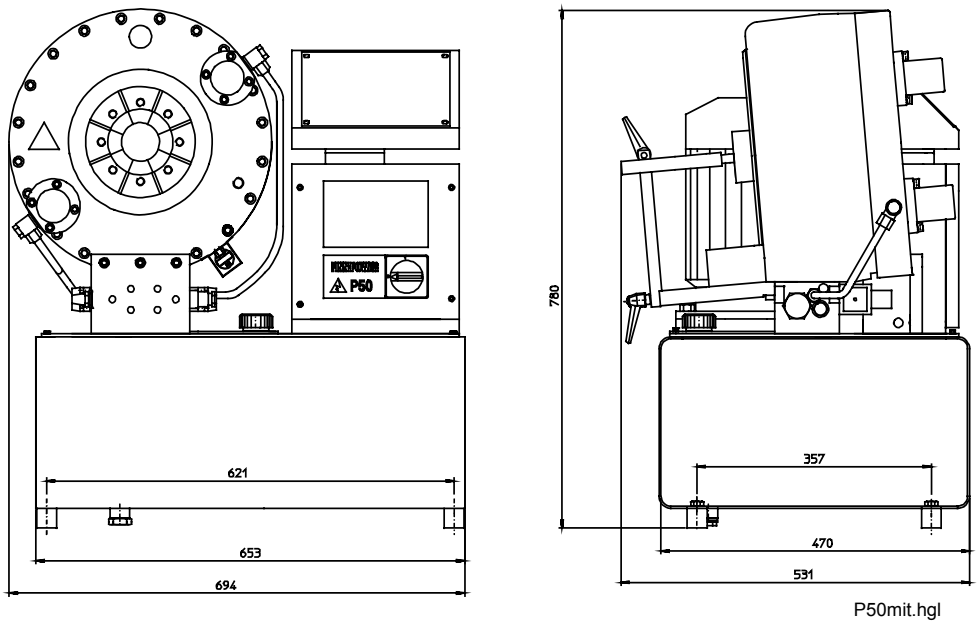
READ THE INSTRUCTIONS THOROUGHLY TO SECURE SAFE AND CORRECT OPERATION OF THE MACHINE.

Technical data P51

		3-phase
Capacity	in	2 ½ (industrial hose 4”)
Crimping diameter range *)	Ø (mm)	4....120
Max opening	mm	46
Pump	l/min	18/6
Max pressure	bar	300
Crimping force	kN	2800
Theoretical production capacity	per hour	720
Sound pressure level	dB(A)	71
Enclosure class		IP 54
Closing speed of master dies (max.)	mm/s	9.2
		Frequency 50 Hz
Motor power	kW	4
Voltage V / Current A / Fuse A		/ /
		230 / 15.3 / 25
		400 / 8.8 / 20
		/ /
		Frequency 60 Hz
Motor power	kW	4.8
Voltage V / Current A / Fuse A		/ /
		230 / 15.2 / 25
		400 / 8.7 / 20
		/ /

*) with complete standard die equipment.
Special diameters and profiles to customer's specifications.

Overall dimensions:



P50mit.hgl

Weight 260 kg, excluding oil.

READ THE INSTRUCTIONS THOROUGHLY TO SECURE SAFE AND CORRECT OPERATION OF THE MACHINE.

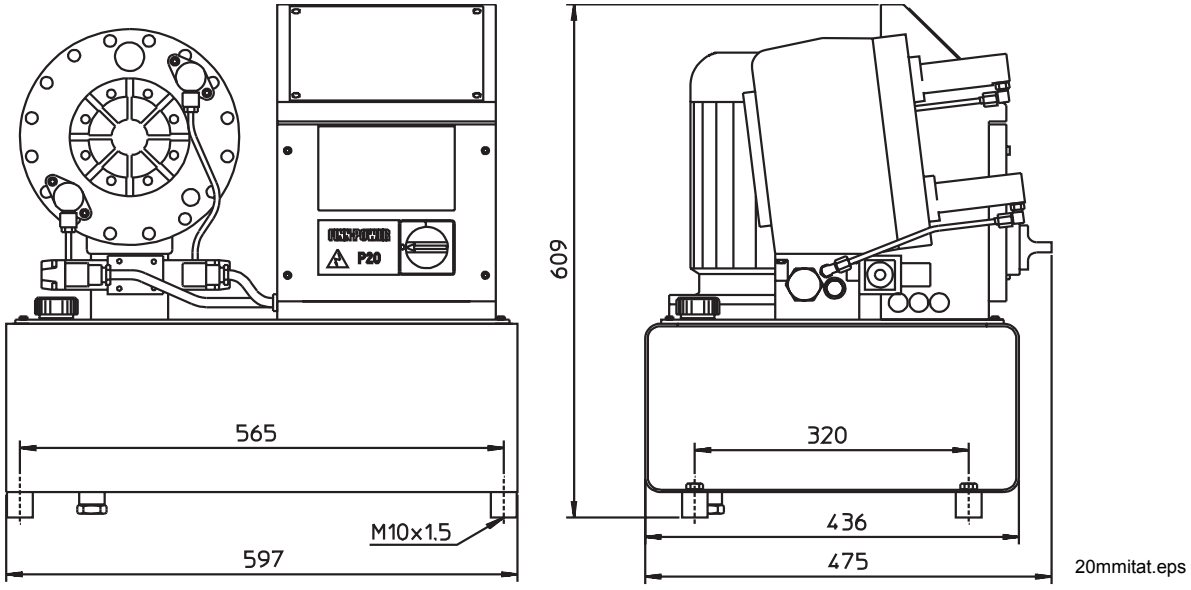
P50mit.hgl

Technical data CC22

		3-phase	1-phase
Capacity	in	1 ¼	1 ¼
Crimping diameter range *)	Ø (mm)	4...54	4...54
Max opening	mm	25	25
Pump	l/min	8	2.8
Max pressure	bar	275	275
Crimping force	kN	680	680
Theoretical production capacity	per hour	1700	500
Sound pressure level	dB(A)	71	71
Enclosure class		IP 54	IP 54
Closing speed of master dies	mm/s	5	2
		Frequency 50 Hz	
Motor power	kW	3	1.5
Voltage V / Current A / Fuse A		□ 200 / 16 / 25	□ 230/ 12.6 / 16
		□ 230 / 11.7 / 20	□ / /
		□ 400 / 6.7 / 16	
		□ / /	
		Frequency 60 Hz	
Motor power	kW	3.6	1.5
Voltage V / Current A / Fuse A		□ 210 / 15.6 / 25	□ 230 / 12.5 / 16
		□ 230 / 10.8 / 20	□ / /
		□ 400 / 6.2 / 16	
		□ / /	

*) Special diameters and profiles to customer's specifications.

Overall dimensions:



Weight 125 kg, excluding oil.

READ THE INSTRUCTIONS THOROUGHLY TO SECURE SAFE AND CORRECT OPERATION OF THE MACHINE.