

Operator's Manual

Danfoss FT1380

Crimp Machine




 **CAUTION:** It is recommended this booklet be read prior to set-up, then used as a guide during actual assembly. Retain for reference purposes.

Table of Contents

Safety Instructions	3
Specifications	4
Specifications	4
Accessories	4
Setup and Installation	4
Operating Instructions	5
Loading and Unloading Die Cages	5
Operating the Keypad	5-6
Entering a Number into the Display	6
Storing a Number from the Display	6
Recalling a Number from the Display	6
Crimping Procedures	7
Calibration	8
Maintenance	9
Maintenance Intervals	9
Die Cage Maintenance Procedures	9
Machine Maintenance Procedures	9
Troubleshooting Tips	10
Crimp Machine Components	11
Die Cage Components	12
Electrical Schematics	13-14
Hydraulic Schematic	15

Safety Instructions

WARNING

Failure to follow Danfoss process and product instructions and limitations could lead to premature hose assembly failures, resulting in property damage, serious injury or death.

Danfoss fitting tolerances are engineered to match Danfoss hose tolerances. The use of Danfoss fittings on hose supplied by other manufacturers and/or the use of Danfoss hose fittings supplied by other manufacturers, may result in the production of unreliable and unsafe hose assemblies and is neither recommended nor authorized by Danfoss.

Read and understand the operator's manual before attempting to operate any equipment.

Danfoss hereby disclaims any obligation or liability (including incidental and consequential damages) arising from breach of contract, warranty, or tort (under negligence or strict liability theories) should Danfoss hose, fittings or assembly equipment be used with the hose, fittings or assembly equipment supplied by another manufacturer, or in the event that product instructions for each specified hose assembly are not followed.

Safety Instructions

1. Prevent Unauthorized operation. Do not permit anyone to operate this equipment unless they have read and thoroughly understand this manual.
2. Wear safety glasses.
3. Avoid pinch points. Do not rest your hand on the crimp ring. Keep your hands clear of all moving parts. Do not allow anyone, other than the operator, close to the equipment while it is in operation.
4. Maintain dies with care. Dies used in the FT1380 crimp machine are sintered powdered metal, offering the best combination of strength and wear resistance for long life. Sintered powdered metal dies are generally brittle and care should be taken to avoid any sharp impact. Never strike a die with a hardened instrument.
5. Use only specified Danfoss products. Make hose assemblies using only Danfoss hose and fittings specified for this assembly equipment.
6. Verify correct crimp diameters. Check and verify correct crimp diameters of all fittings after crimping. Do not put any hose assemblies into service if the crimp diameters do not meet Danfoss crimp specifications.
7. Make sure all dies are completely in place and the cage is positioned properly on the pressure plate.
8. Do not over pressurize. Do not exceed the 10,000 psi hydraulic pressure supplied to the machine. This setting is preset at the factory and should not require adjustment.
Note: All components used to connect the pump and crimp cylinder must meet the criteria set forth in the Material Handling Institute Specification #IJ100 for hydraulic jacking applications.
9. Die change. Do not insert/remove dies while the power is on.
10. Secure the equipment to a stable work surface. Prior to operation, secure the crimp machine to a stable work surface to prevent the equipment from tipping.
11. Unplug the power supply when not in use.
12. Keep work area clean. Cluttered areas and benches invite accidents.

Specifications

Specifications

Electrical Requirements

FT1380-115	115-Volt AC single phase (50/60) Hz Circuit with a minimum of 20 amps
FT1380-230	208 to 230-Volt AC single phase (50/60) Hz Circuit with a minimum of 15 amps

Crimp Machine Dimensions

Width	14.25 inches
Depth	25.75 inches
Height	28.50 inches
Weight	238 pounds

Production Capacity

Danfoss braided and spiral hydraulic hoses which use TTC/Z or 4S/6S series hose ends through -20 size.

Accessories

Die Cage Repair Kits

Die cage repair kits for FT1380-200-size, FT1380-275-size.
Part number..... FT1380-2-9

Die Holder Kit

A set includes four plates and mounting hardware that can hold up to eight die cages. This kit attaches to the sides of the Danfoss FT1380 crimp machine.

Part number..... FT1380-2-4

Optional Fitting Backstop

Part number..... FT1380-4

TTC/Z Series Fitting Locators


Part number..... FT1330-XL

4S Series Fitting Locators (cannot be used in combination with FT1330-XL locators)

Part number..... FT1380-XL

Setup and Installation

1. Mount your Danfoss FT1380 crimp machine onto a workbench that will support at least 300 pounds. Secure the unit using the holes provided in the corners of the crimp machine base.
2. Remove the plug from the hydraulic reservoir vent port and replace it with the vent cap that is supplied with the unit.

3.  **CAUTION:** Failure to do so will cause cavitation and damage to the pumping mechanism. Hand tighten the vent cap.

CAUTION: Provide electrical service with a dedicated circuit (per the crimp machine electrical requirements) to eliminate the possibility of a low-voltage situation.

4. Never use an extension cord, always plug directly into the power outlet.

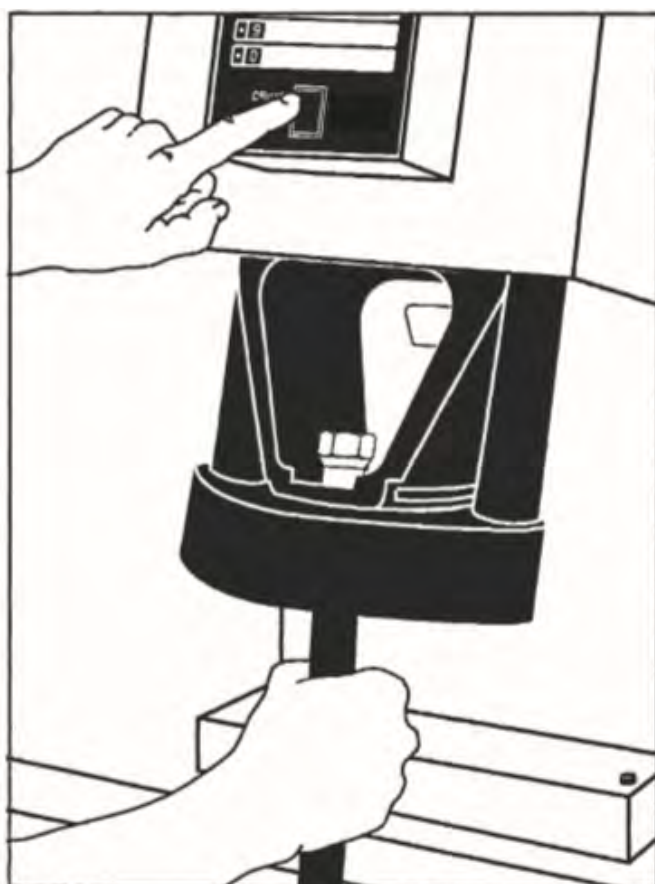
Die Cages

Part number.....	FT1380-275-M070
.....	FT1380-275-M090
.....	FT1380-275-M120
.....	FT1380-200-M150
.....	FT1380-200-M180
.....	FT1380-200-M210
.....	FT1380-200-M240
.....	FT1381-200-M280
.....	FT1380-200-M320
.....	FT1380-200-M370
.....	FT1380-200-M420
.....	FT1382-200-M465
.....	FT1382-275-M520

Operating Instructions

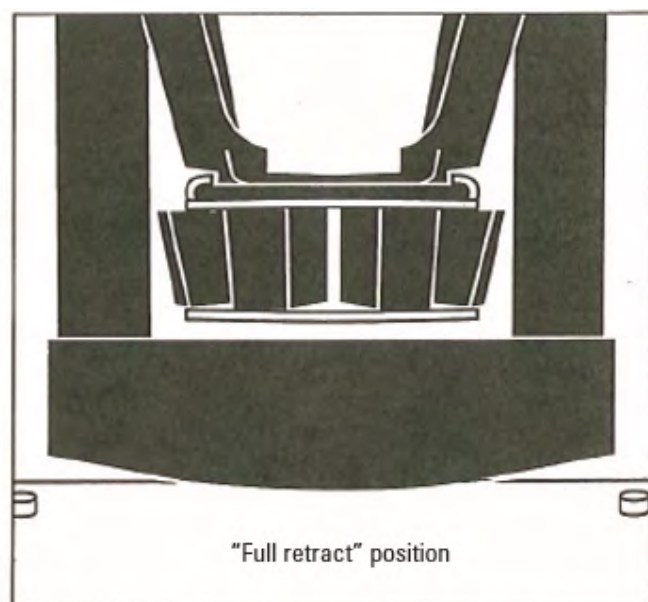
Loading and Unloading Die Cages

To load the die cage, press and hold the RETRACT switch (figure 1) until the crimp ring reaches the "full retract" position and stops. The die cage may be inserted or removed in this position (figure 2). The FT1380 crimp machine will automatically retract when it has reached the setting entered on the keypad (this is when crimp is complete).



Operating the Keypad

1. The DISPLAY shows the three-digit setting that will determine the crimp diameter. The ratio of the crimp diameter change to the DISPLAY change is 1 to 1. For example, if you crimp a fitting at a setting of 120, and the crimp diameter is .035 inch too large, you will need to decrease the DISPLAY by .035 to $(120 - 035) = 085$. A display of 085 should produce the correct crimp diameter.
2. The STORE button is used to store the DISPLAY reading in any of the 10 numbered keys. The green light next to the STORE button will illuminate when you are working in the STORE mode.



Operating the Keypad (cont.)

3. The ENTER button is used to put any three-digit number into the DISPLAY. The green light next to the ENTER button will illuminate when you are working in the ENTER mode.
4. The numbered keys have two functions:
 - a. In the Enter mode, their numeric value is put into the DISPLAY.
 - b. In the STORE mode, they act as 10 different locations in which to store a DISPLAY setting.

Entering a Number into the Display

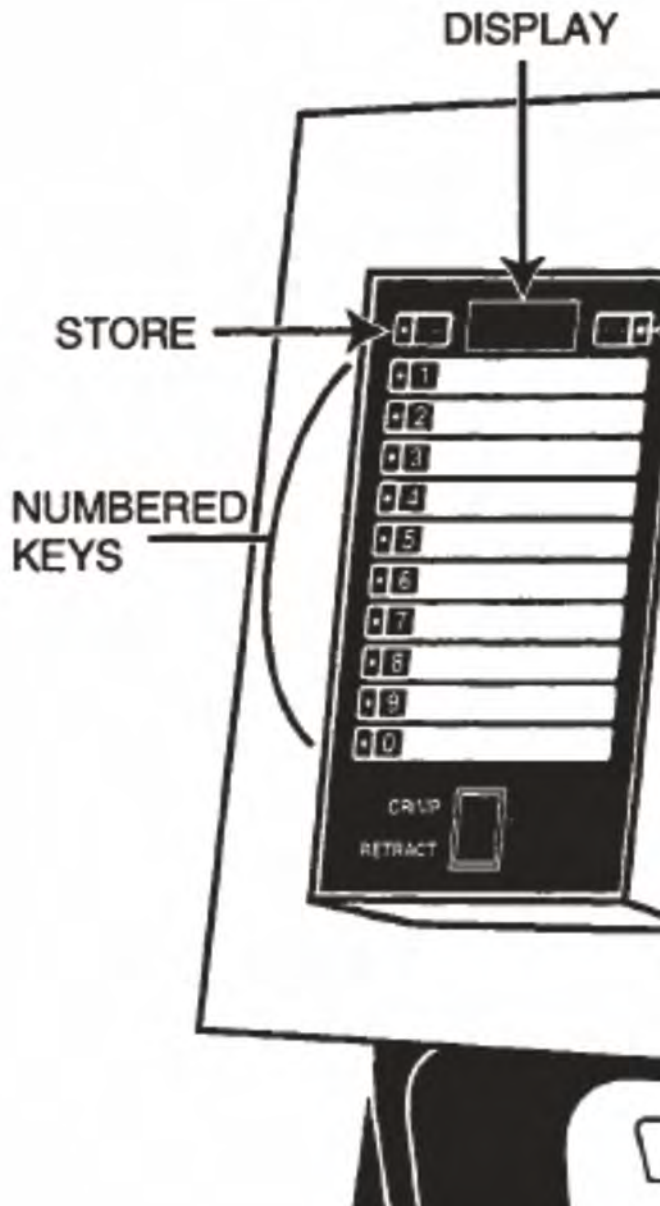
1. Turn the power control switch on the back of the crimp machine to the ON position. The work light and the DISPLAY will illuminate to show that the power is on.
2. Press the ENTER button (the green light next to the ENTER button will illuminate).
3. Press three numerical buttons in less than five seconds. (If more than five seconds elapse, the display reverts back to its previous setting.) After the third number is entered, the display will remain.
4. The FT1380 is now ready to crimp to the DISPLAY setting.

Storing a Number from the Display as a Preset

1. Enter a three-digit number as described in the procedure above.
2. Press the STORE button. (The green light next to the STORE button will illuminate.)
3. Press and hold down any one of the ten numerical buttons for three seconds. (At the end of three seconds, the green light next to button will illuminate, indicating that the display has been stored to that button.)

Recalling a Preset into the Display

1. Make sure that the STORE and ENTER lights are off. (If one is on, it will go off in five seconds if left untouched.)
2. Press the button that has the stored setting for a given hose and fitting style. This setting will then be seen in the DISPLAY.



Crimping Procedures

⚠ WARNING : Maintain clear distance from all moving parts.

Refer to the current Danfoss PowerSource Crimp Spec tool for complete and detailed crimp specification information for each hose and fitting style.

1. Retract the crimp ring by depressing the retract switch until the crimp ring is fully retracted. Select the proper die cage as shown in the PowerSource Crimp Spec tool. Slide the die cage into the cage holder slots.
2. Press the proper PRESET button or key in a value to the DISPLAY (see example).
3. Position the fitting within the crimp cage aligning the scribe line to the top of the dies.
4. To crimp the fitting, depress the CRIMP switch. The crimp ring will rise until the fitting is fully crimped (Figure 4). It will then stop and begin to retract, signifying that the crimp is complete. Remove your finger from the CRIMP switch. The crimp ring will automatically retract.

Hint: Retraction can be halted at any point by momentarily depressing the RETRACT switch, and then resumed by depressing and holding the RETRACT switch.

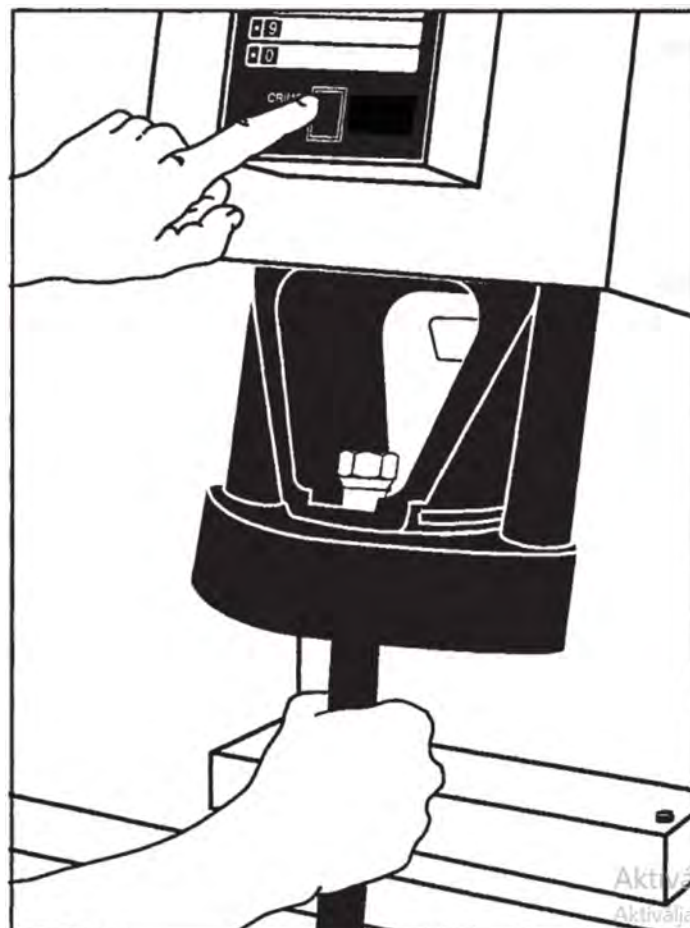
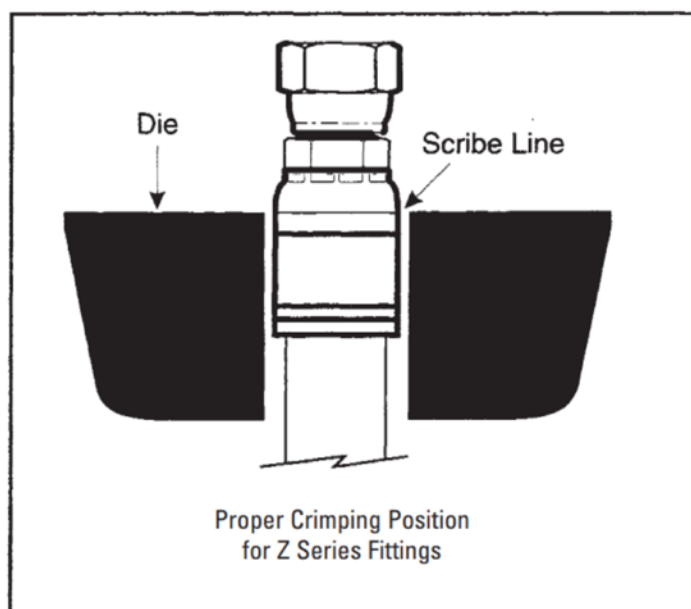
5. Verify correct crimp diameter.

Reminder: Full retraction is required for changing die cages.

Example:

Enter the number "300" into the DISPLAY and start the crimping process. If the dies crimp the fitting, measure the crimp diameter and decrease the DISPLAY setting by the same amount that you wish to decrease the crimp diameter. If the dies don't touch the fitting, lower the DISPLAY setting by 050 to "250" and try to crimp the fitting again. If that still isn't enough, continue to reduce the DISPLAY setting by 050 increments until the dies make contact with the fitting. Then measure the crimp diameter and decrease the DISPLAY setting by the same amount that you wish to decrease the crimp diameter.

If a display setting of "250", using GH78108/H28008 hose with TTC/Z Series fittings produces a crimp diameter of 1.124 inches, subtract the crimp specification (0.990 inches) from the diameter that you need measured ($1.124 - 0.990 = 0.134$). Then, subtract "134" from the DISPLAY setting ($250 - 134 = 116$) and change the DISPLAY to "116". Crimp the fitting again and measure the crimp diameter. If the crimp diameter is still too large, repeat this process.



Calibration

Must do Part I and Part II

⚠ WARNING : Maintain clear distance from all moving parts.

The calibration procedure below will calibrate the Danfoss FT1380 crimp machine to the original factory setting. While new machines are calibrated at the factory and will be ready to use out of the crate, this procedure should be followed if the crimp machine has been disassembled or has had components replaced. The procedure requires the use of an FT1380-200-M240 die cage, a TTC/Z Series -8 fitting and a TTC/Z Series -12 fitting.

1. **⚠ CAUTION:** While in the calibration mode, follow the instructions precisely and press the keys deliberately. If a mistake is made, the calibration procedure must be started over from the beginning.

Part I

1. Insert an FT1380-200-M240 die cage.
2. Press the STORE and ENTER buttons simultaneously, then release. Both button lights will now be illuminated and will remain so until the calibration procedure is finished.
3. Enter in the value of "100" using the keypad. (Don't hit enter.)
4. Center a TTC/Z Series -8 fitting (without a hose) in the die cage, holding the socket or fitting in place with a pencil or other suitable tool. Crimp the socket by depressing the crimp switch until the machine retracts by itself, indicating a completed cycle. Allow the crimp ring to return to the "soft retract" position.
5. Using a set of calipers, measure the crimp diameter. The preferred method is to use the average of the four pairs of indentations.
6. Locate the crimp diameter in Table A, below. Using the keypad, enter in the three-digit Display Reading that corresponds to the Crimp Diameter.

Note: If your Crimp Diameter falls between the numbers shown in Table A, simply determine or interpolate the Display Reading, since the numbers are a direct ratio.

Table A for -8	
Crimp Diameter	Display Reading
0.940	040
0.950	050
0.960	060
0.970	070
0.980	080
0.990	090
1.000	100
1.010	110

Table B for -12	
Crimp Diameter	Display Reading
1.240	340
1.250	350
1.260	360
1.270	370
1.280	380
1.290	390
1.300	400
1.310	410

Part II

1. Enter in the value of "400" using the keypad. (Don't hit enter.)
2. Center a TTC/Z Series -12 fitting (without a hose) in the die cage, holding the socket or fitting in place with a pencil or other suitable tool. Crimp the socket by depressing the crimp switch until the machine retracts by itself, indicating a completed cycle.
3. Repeat steps 5 and 6 at left, except use Table B instead of Table A for the -12 fitting.
4. After the three-digit Display Reading is entered, the machine will automatically exit the calibration mode.

Calibration Example

Part I

Crimp a TTC/Z Series -8 fitting and measure the four crimp diameters around the socket. For example, the diameters measure .942, .946, .945 and .945 inches, to obtain the average diameter, add the four diameters and divide that sum total by 4.

$$(.942+.946+.945+.945)/4 = (3.778)/4 = 0.9445 = 0.945$$

(round to nearest thousandth)

Look at the Crimp Diameter column in Table A and find your average diameter. If it falls between two numbers, as this one does, interpolate the desired setting. In this case, you would enter 045. If your crimp diameter was .940, you would enter 040; if it was .942, you would enter 042.

Part II

Crimp a TTC/Z Series -12 fitting and measure the four crimp diameters around the socket. This time, let's say that the diameters measure 1.247, 1.249, 1.249 and 1.248 inches. Average the measures by adding the four diameters and dividing that sum total by 4.

$$(1.247+1.249+1.249+1.248)/4 = (4.993)/4 = 1.24825 = 1.248$$

(round to nearest thousandth)

Look at the Crimp Diameter column in Table B and find your average diameter. If it falls between two numbers, as this one does, interpolate the desired setting. In this case, you would enter 348. If your crimp diameter was 1.250, you would enter 350; if it was 1.249, you would enter 349.

Maintenance

Maintenance Intervals

Die Cage Lubrication

Every 50 crimps	Relube sliding surfaces of dies
Every 500 crimps	Remove old grease and relube
Every 1000 crimps	Die cage maintenance

Crimp Ring Maintenance

Every 500 crimps	Remove old grease and relube
Every 2000 crimps	Remove old grease, inspect for wear or damage and relube if okay

Use high efficiency PTFE grease (part number T-400-G for 4 oz tube, FF91455 for 16 oz can)

Die Cage Maintenance Procedures

1. Lubricate the die cage. For maximum service, FT1380 die cages require lubrication at 50-crimp intervals with high efficiency PTFE grease. FF91455 is a 16 ounce container that will provide sufficient lubricant for about 10,000 crimps.

Periodically remove grease residue that has built up on the sides of the dies and in the crimp ring during the crimping process. Residue becomes contaminated with metal and plating chips and airborne contaminants, which can cause premature wear of the dies and crimp ring. It should carefully be removed without mixing it with newly applied grease.

2. Die cage maintenance should be performed at 1000- crimp intervals or every six months, whichever occurs first. Die cages should be free of grease and debris and inspected for worn or damaged components.
 - a. The sliding surface of the dies should appear smooth with no apparent galling. Galled dies must be replaced. Individual dies in a cage can be replaced without replacing all eight dies.
 - b. Replace springs that show any sign of damage or collapse such as those which are shorter than the other springs.
 - c. The spring plate should appear smooth with no apparent galling. Galled spring plates must be replaced.
 - d. Inspect remaining components, and replace those that are badly worn.

Reassemble components, and liberally apply high efficiency PTFE grease to the die surface which slides along the spring plate. Torque the die cage bolts to 50 in. -lbs.

Ensure that all dies slide in and out freely.

Maintenance Procedures

Machine Maintenance Procedures

1. Sliding surfaces must be kept free of dirt and other abrasive materials.
2. All exposed black metal surfaces should be coated occasionally with a light film of oil to prevent corrosion.
3. Periodically check the oil level in the fluid reservoir of the hydraulic power unit. Maintain the oil level according to the indicator on top of the reservoir. Add ENERPAC hydraulic oil as needed.

Note: Completely retract the crimp ring when checking the oil level.

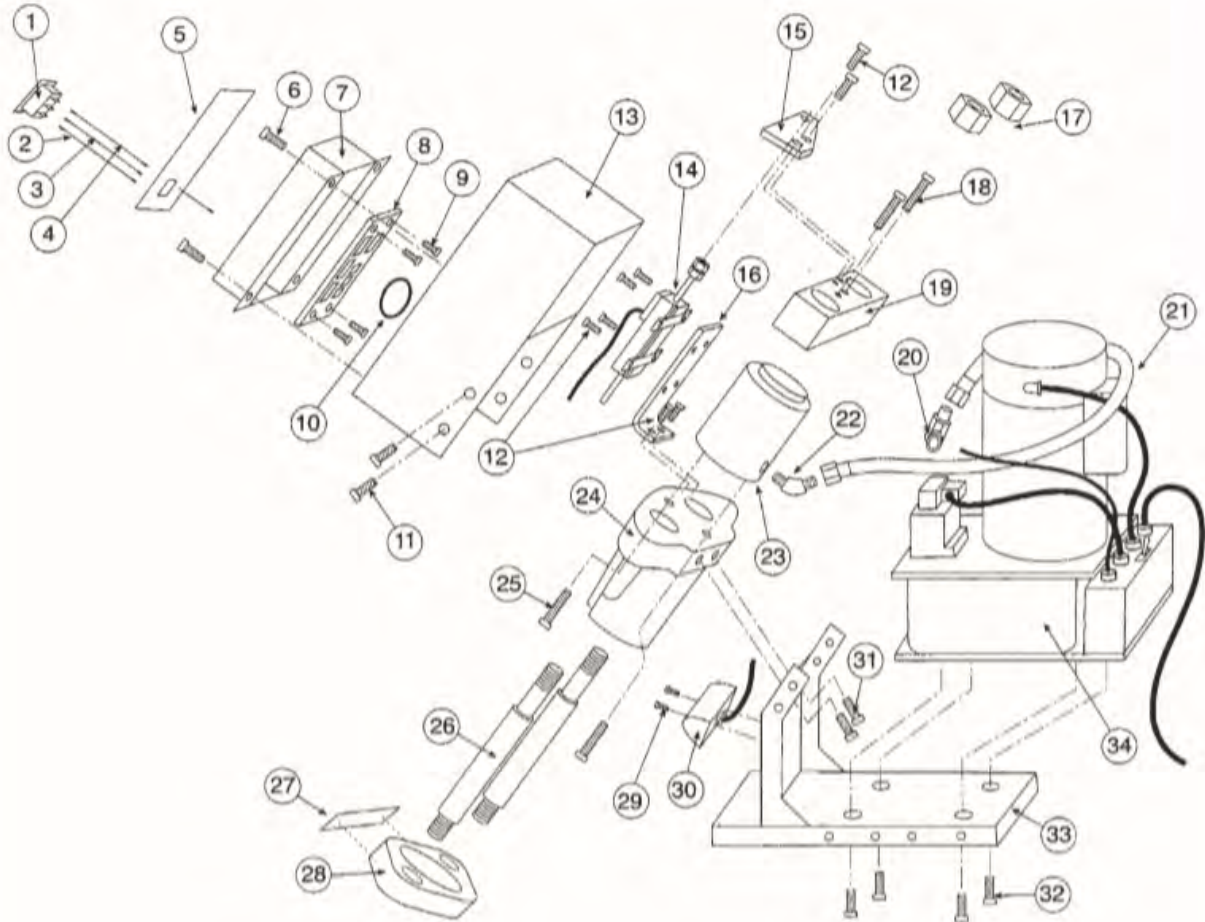
Troubleshooting Tips

Remember: The electric motor only runs during the crimping process. The motor energizes when the crimp switch is pressed and de-energizes when the crimp switch is released or when the crimp cycle is completed. While retracting, the hydraulic dump valve is energized. When the valve is energized, oil flow is directed from the pump to the cylinder. When the valve is de-energized, oil flows from the cylinder back to the reservoir.

<i>Symptom</i>	<i>Possible</i>	<i>Cause Corrective Action</i>
Pump will not start	<ul style="list-style-type: none"> No power or wrong voltage 	<ul style="list-style-type: none"> Make sure that the unit is plugged in. Make sure that the power source is on. Make sure that the power voltage is correct. Check for loose wires on the circuit board. Check for loose wires on the CRIMP switch.
Motor stalls under load	<ul style="list-style-type: none"> Low voltage 	<ul style="list-style-type: none"> Verify that the branch circuit conforms to the electrical schematics on Page 13 of this manual. Remove any extension cords.
Electric valve will not operate	<ul style="list-style-type: none"> No power or wrong voltage Low voltage 	<ul style="list-style-type: none"> Check for loose wires on the circuit board. Check for loose wires on the CRIMP switch. Make sure that the power voltage is correct.
Pump fails to build pressure	<ul style="list-style-type: none"> External leak in system Internal leak in pump Internal leak in valve Internal leak in system component 	<ul style="list-style-type: none"> Wipe away spilled oil, and locate the source of leak. If the hose assembly is leaking, tighten or replace it. If the pump or cylinder is leaking, refer to the ENERPAC Repair Parts Sheets. Slight oil seepage of the cylinder is normal.
Pump builds less than full pressure	<ul style="list-style-type: none"> Relief valve set low External system leak Internal leak in pump Internal leak in valve Internal leak in system component 	<ul style="list-style-type: none"> Refer to the ENERPAC Repair Parts Sheets for possible adjustment or leakage repair.
Pump builds full pressure, but cylinder does not move	<ul style="list-style-type: none"> Tie rods may be binding Flow to cylinder blocked 	<ul style="list-style-type: none"> Replace the tie rods. Refer to the ENERPAC Repair Parts Sheets.
Cylinder will not return	<ul style="list-style-type: none"> Valve malfunction Restricted/blocked Tie rods may be binding Die cage may be binding 	<ul style="list-style-type: none"> Refer to the ENERPAC Repair Parts Sheet for valve or cylinder repair. Replace the tie rods. Check the die cage and crimp ring for damage, and repair or replace them if necessary. Lubricate the die cage per the maintenance procedures on Page 9. Lubricate the tie rod bushings per the maintenance procedures on Page 9.
Crimp diameters change	<ul style="list-style-type: none"> Incorrect hose/fitting combination Incorrect die cage Die cage or crimp insert damage Transducer is loose Loose crimp machine components External damage to crimp machine Insufficient lubrication on dies 	<ul style="list-style-type: none"> Verify the correct hose/fitting combination. Verify the correct die cage. Repair or replace the damaged components. Tighten the transducer and brackets, and then recalibrate them if necessary. Tighten any loose bolts or screws. Lubricate the die cage per the maintenance procedures on Page 9. Lubricate the tie rod bushings per the maintenance procedures on Page 9.
DISPLAY blinks	<ul style="list-style-type: none"> Loose or broken wires 	<ul style="list-style-type: none"> Tighten any wires that may have become loose on the circuit board, pump electrical enclosure, or CRIMP switch.

If the symptom appears to be solely pump or cylinder related, refer to the ENERPAC Repair Parts Sheets.
Any electrical checks must be performed by a qualified electrician.

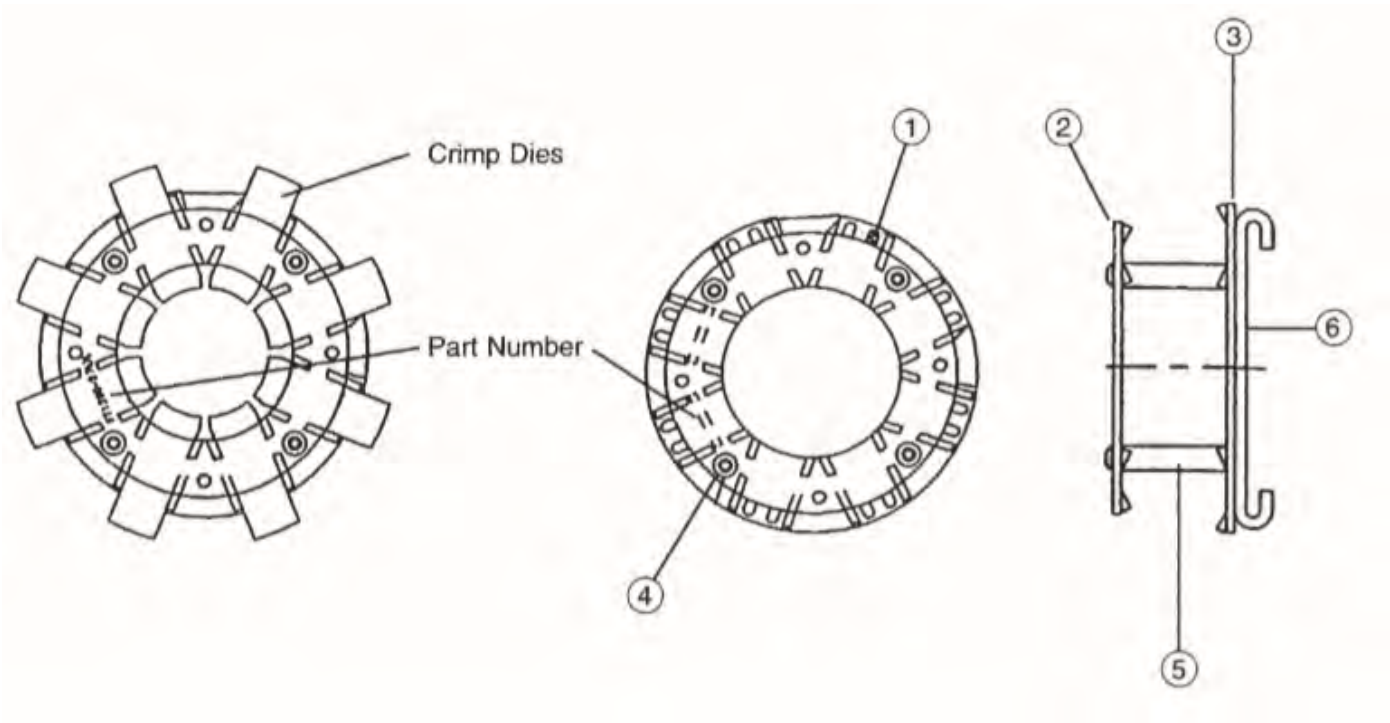
Crimp Machine Components



Detail	Part Number	Description	Qty
1	FT1380-3-3	Switch 1	
2	FT1380-3-31	Wire, Red 16 ga. 4.5" Long	1
3	FT1380-3-32	Wire, White 16 ga. 5" Long	1
4	FT1380-3-33	Wire, Red 16 ga. 5.5" Long	1
5	FT1380-3-6	Keypad	1
6	FT1380-3-23	Screw 8-32 x 3/8" Stainless SHCS	4
7	ET4020C-0001	Electrical Enclosure	1
8	FT1380-3-4	Circuit Board Assembly	1
9	FT1380-3-18	Screw 4-40 x 3/16" SHCS	4
10	FT1380-3-29	Grommet	1
11	FT1380-3-24	Screw 1/4-20 x 3/8" Stainless SHCS	4
12	FT1380-3-26	Screw 8-32 x 3/8" SHCS	8
13	ET4020C-0002	Main Guard	1
14	FT1380-3-5	Transducer Assembly	1
15	FT1380-3-17	Bracket, Transducer Rod	1
16	FT1380-3-16	Bracket, Transducer	1
17	FT1380-3-21	Nut	2

Detail	Part Number	Description	Qty
18	FT1380-3-22 1	1/4-20 x 2 1/2" SHCS	2
19	FT1380-3-15	Top Bar	1
20	FF2032T0606S	Adapter	1
21	504-21010-03100	Hose Assembly	1
22	FF2093T0606S	Adapter	1
23	FT1380-3-2	Cylinder Assembly	1
24	FT1380-3-12	Pusher	1
25	FT1380-3-19	Screw 3/8-16 x 1 1/2" SHCS	2
26	FT1380-3-14	Tie Rod	2
27	FT1289-3-60	CAUTION Decal	1
28	FT1380-3-13	Crimp Ring	1
29	FT1380-3-27	Screw 6-32 x 1/2" SHCS	2
30	FT1380-3-8	Work Light	1
31	FT1380-3-25	Screw 1/2-13 x 1" SHCS	2
32	FT1380-3-20	Screw 3/8-16 x 3/4" SHCS	4
33	FT1380-3-9	Frame	1
34	FT1380-3-1	Hydraulic Pump Assembly 115V	1
	or		
	FT1380-3-35	Hydraulic Pump Assembly 230V	

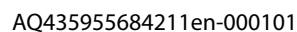
Die Cage Components



Detail Number	FT1380-2-9 Bill of Material	FT1380-2-9A Bill of Material	FT1381-2-9 Bill of Material	Description	Qty Req'd
1	FT1330-2-9-21	FT1330-2-9-2	FT1330-2-9-21	Die Spring	8 or 16*
2	FT1380-2-9-3	FT1380-2-9-2	FT1381-2-9-3	Front Plate	1
3	FT1330-2-9-13	FT1330-2-9-3	FT1330-2-9-13	Spring Plate	1
4	FT1330-2-9-55	FT1330-2-9-5	FT1381-2-9-55	Cap Screw	4
5	FT1330-2-9-66	FT1330-2-6-6	FT1381-2-9-66	Spacers	4
6	FT1380-2-9-1	FT1380-2-9-1	FT1380-2-9-1	Back Plate	1

* The FT1380-200-NO. (FT1380-2-9) and FT1381-200-NO (FT1391-2-9) require 16 springs and the FT1380-201-NO. (FT1380-2-9A) requires 8 springs.

Electrical Schematic for FT1380-115 (115V model)



Electrical Schematics

Terminal Blocks and Pin Numbers (115V and 230V models)

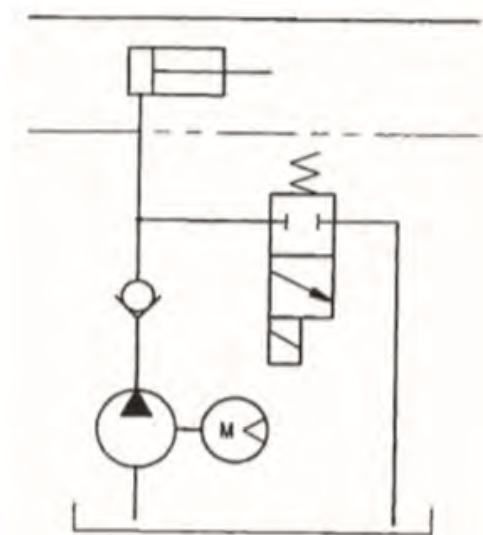
Terminal Block	Pin Number	Voltage	Wire Color	Description
TB1	1	+12V AC	Black	From transformer
(2 wires)			Black	To work light
TB2	2	+0V AC	White	From transformer
(2 wires)			White	To work light
TB1	3	None	Green	To earth ground
TB2	1	+4.04V DC	Orange	To transducer
TB2	2	+4.04 to 0.04V DC*	Red	To transducer
TB2	3	+0.04V DC	Brown	To transducer
TB2	4	+5V DC	Red	Crimp switch
TB2	5	0V DC	White	Switch common
TB2	6	+5V DC	Red	Retract switch
TB3	1	+24V AC	Orange	To dump valve
TB3	2	+24V AC	Red	To motor contractor

* The voltage at TB2 pin 2 varies between 4.04V DC and 0.04V DC, depending on the position of the crimp ring.

Hydraulic Schematic

SEQUENCE

1. Pump on – Cylinder advances
2. Valve energized – Cylinder retracts
3. Pump and valve de-energized – Cylinder holds position



About Danfoss Power Solutions FC

Danfoss hoses, fittings, and tooling provide the ultimate fluid conveyance solutions for a variety of equipment and applications around the world. We proudly engineer to support a sustainable future for tomorrow.

To learn more please visit: <http://www.danfoss.com/en/about-danfoss/our-businesses/power-solutions>

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