

## 4-Way Reversing Valves

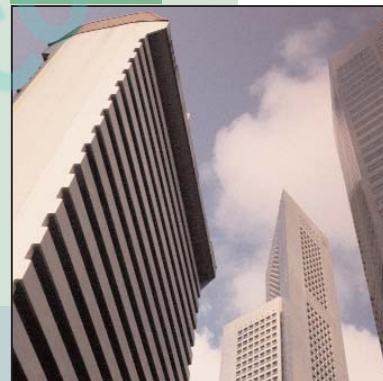
*Reversing Valves*



People



Products



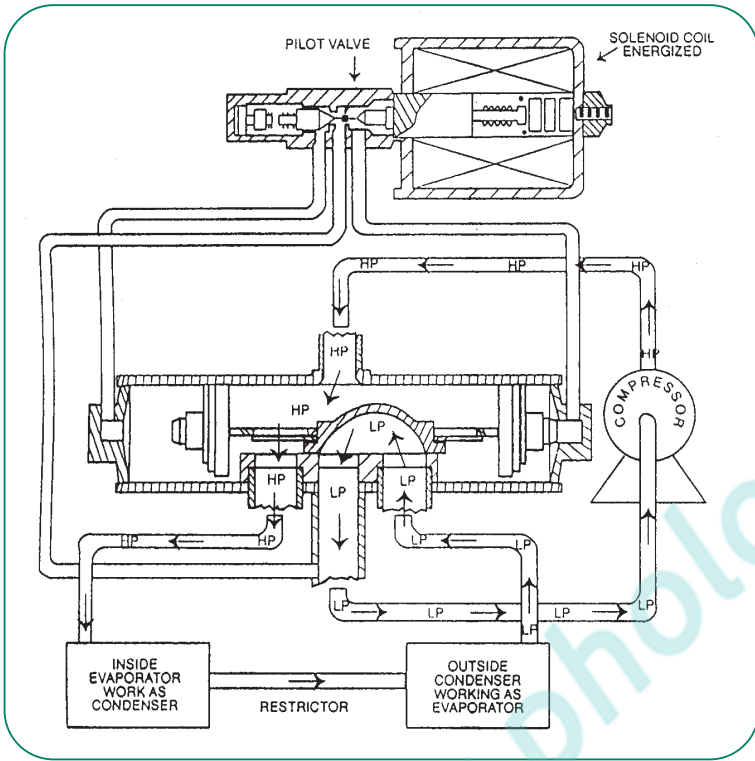
Performances

- *Wide Application Range*
- *High Reliability*
- *Minimum Pressure Drop*
- *Low Risk Leakage*
- *UL Approved*





# Application and Principle of Operation



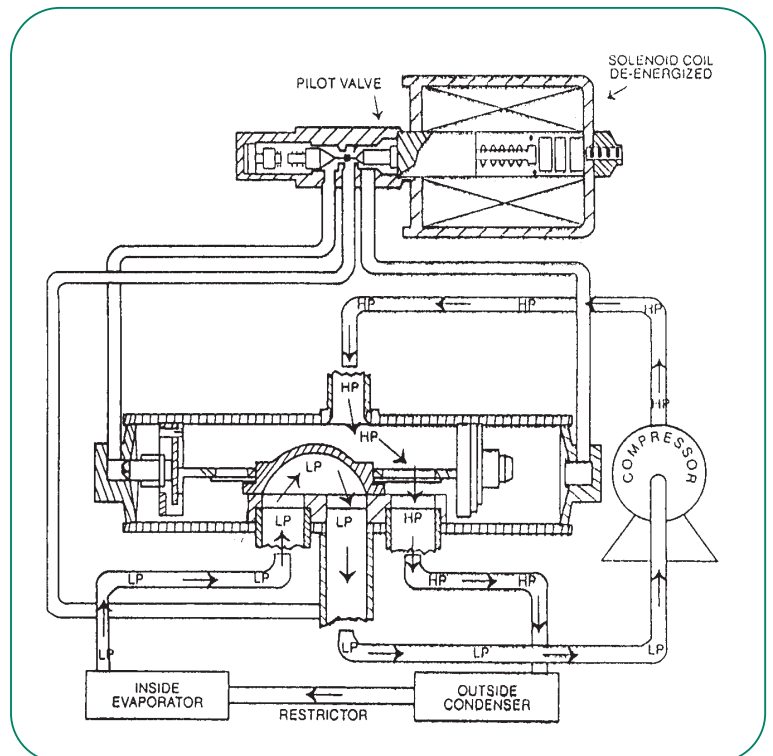
## Coil energized

The 4-way valves are used in reversible applications such as heat pumps or reversible air conditioning units and chillers.

The 4-way valve allows an inversion of the refrigeration cycle, changing from cooling mode in Summer to heating mode in Winter.

The cycle inversion is initiated by a small solenoid pilot valve, which triggers the movement of a slide, thus inverting the flow direction of the refrigerant.

The valve is connected to the suction and discharge pipes.



**4-way Reversing Valve is the key component to provide Heating and Cooling from the system to be conditioned space by reversing the flow direction of refrigerant.**

**It is used at room conditioners, packaged and central air conditioners.**

**Reversing Valves are designed for Heat Pump Systems with capacity from 0.75Hp to 8Hp. They are suitable for most refrigerants as R22 - R410A - R407C.**

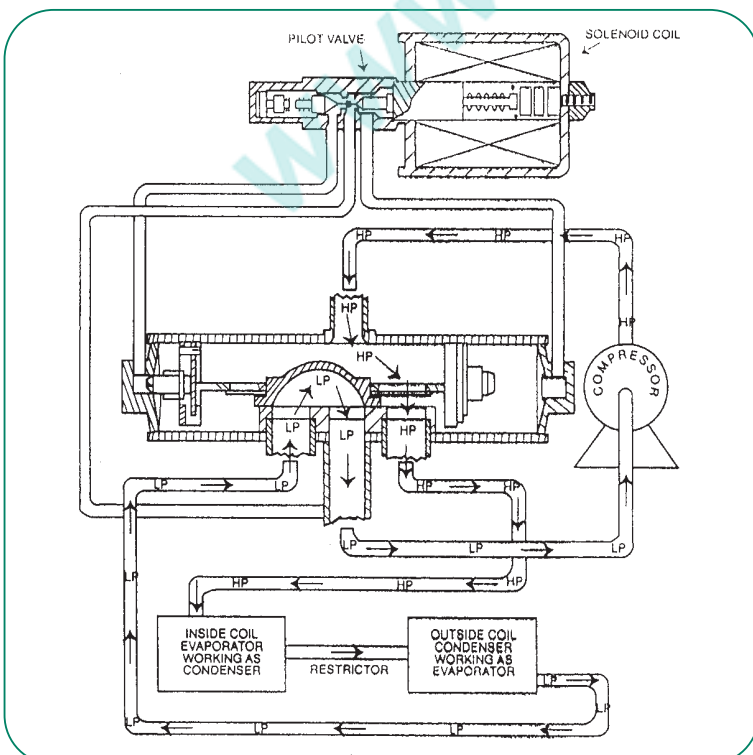
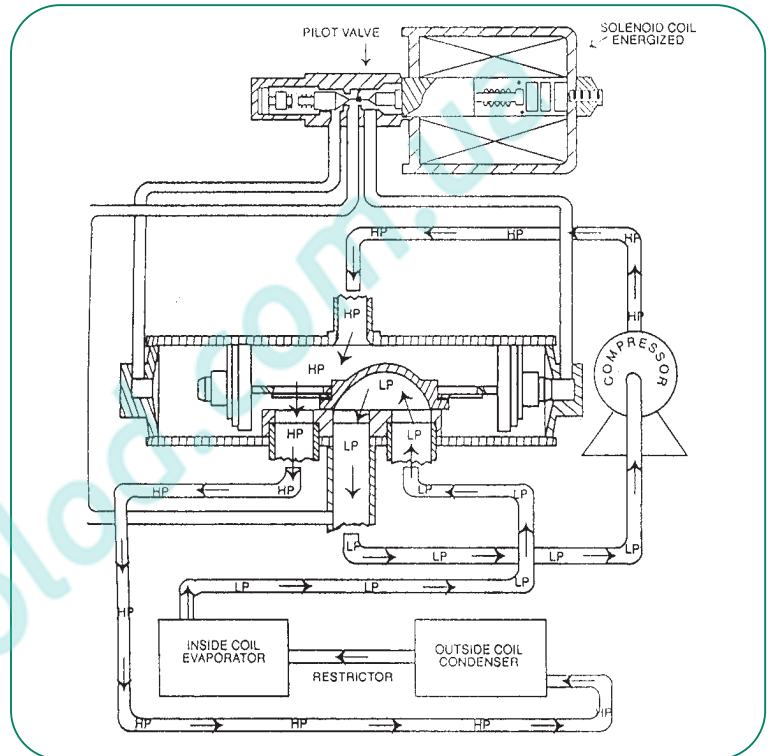
## Coil de-energized

The pilot valve ensures a very reliable changeover from cooling to heating mode; the changeover happens instantaneously with a minimum pressure differential.

The valve design also guarantees a minimum pressure drop and very low risk of leakage

The models offer a wide range of connection sizes, configurations and capacity for specific applications.

The standard models are available in small quantities per box providing increased flexibility.



# Reversing Valves Table



## V-Series



Part Number	R407C kW min/max (US ton min/max)	R410A kW min/max (US ton min/max)	R134A kW min/max (US ton min/max)	C.T.S.		Style	Mass (W/O coil)	Qty/box	Coil
				S.E.C. mm	Discharge mm				
V0-406050100	1,34 / 3,02 (0,38 / 0,86)	1,55 / 3,83 (0,44 / 1,09)	1,16 / 2,36 (0,33 / 0,67)	9,64	8,12	B	210	36	LDL/LDK
V1-408050100	1,41 / 4,57 (0,4 / 1,3)	1,76 / 5,98 (0,50 / 1,70)	1,41 / 3,87 (0,4 / 1,1)	12,84	8,01	A	285	36	LDL/LDK
V1-408060100	1,41 / 4,57 (0,4 / 1,3)	1,76 / 5,98 (0,50 / 1,70)	1,41 / 3,87 (0,4 / 1,1)	12,84	9,67	A	285	36	LDL/LDK
V1-406060100	1,41 / 4,57 (0,4 / 1,3)	1,76 / 5,98 (0,50 / 1,70)	1,41 / 3,87 (0,4 / 1,1)	9,64	9,67	A	285	36	LDL/LDK
V1-406050100	1,41 / 4,57 (0,4 / 1,3)	1,76 / 5,98 (0,50 / 1,70)	1,41 / 3,87 (0,4 / 1,1)	9,64	8,01	A	285	36	LDL/LDK
V1-406050200	1,41 / 4,57 (0,4 / 1,3)	1,76 / 5,98 (0,50 / 1,70)	1,41 / 3,87 (0,4 / 1,1)	9,64	8,12	B	310	36	LDL/LDK
V1-406060200	1,41 / 4,57 (0,4 / 1,3)	1,76 / 5,98 (0,50 / 1,70)	1,41 / 3,87 (0,4 / 1,1)	9,64	9,67	B	310	36	LDL/LDK
V2-408060100	2,81 / 6,33 (0,8 / 1,8)	3,17 / 7,74 (0,90 / 2,20)	2,46 / 4,92 (0,7 / 1,4)	12,84	9,67	A	285	36	LDL/LDK
V2-408060200	2,81 / 6,33 (0,8 / 1,8)	3,17 / 7,74 (0,90 / 2,20)	2,46 / 4,92 (0,7 / 1,4)	12,84	9,67	B	310	36	LDL/LDK
V2-410060300	3,87 / 7,03 (1,1 / 2,0)	4,57 / 8,79 (1,30 / 2,50)	3,17 / 5,63 (0,9 / 1,6)	16,03	9,67	C	315	36	LDL/LDK
V2-410060400	3,87 / 7,03 (1,1 / 2,0)	4,57 / 8,79 (1,30 / 2,50)	3,17 / 5,63 (0,9 / 1,6)	16,03	9,67	D	335	36	LDL/LDK
V3-410080700	3,87 / 9,50 (1,1 / 2,7)	4,57 / 11,96 (1,30 / 3,40)	3,17 / 7,39 (0,9 / 2,1)	16,03	12,84	E	310	36	LDL/LDK
V3-410080700	3,87 / 9,50 (1,1 / 2,7)	4,57 / 11,96 (1,30 / 3,40)	3,17 / 7,39 (0,9 / 2,1)	16,03	12,70 O.D.	E	310	36	LDL/LDK
V3-412080800	3,87 / 9,85 (1,1 / 2,8)	4,57 / 12,31 (1,30 / 3,50)	3,17 / 7,74 (0,9 / 2,2)	19,18	12,84	E	350	36	LDL/LDK
V6-414120100	3,87 / 18,99 (1,1 / 5,4)	4,57 / 23,92 (1,30 / 6,80)	3,17 / 14,77 (0,9 / 4,2)	22,36	19,18	A	810	18	LDL/LDK
V6-414100100	3,87 / 18,99 (1,1 / 5,4)	4,57 / 23,92 (1,30 / 6,80)	3,17 / 14,77 (0,9 / 4,2)	22,36	16,03	A	810	18	LDL/LDK
V6-414080100	3,87 / 18,99 (1,1 / 5,4)	4,57 / 23,92 (1,30 / 6,80)	3,17 / 14,77 (0,9 / 4,2)	22,36	12,83	A	810	18	LDL/LDK
V6-412080100	3,87 / 18,99 (1,1 / 5,4)	4,57 / 23,92 (1,30 / 6,80)	3,17 / 14,77 (0,9 / 4,2)	19,18	12,83	A	745	18	LDL/LDK
V10-414080100	11,25 / 33,06 (3,2 / 9,4)	13,01 / 41,85 (3,70 / 11,90)	9,85 / 26,03 (2,8 / 7,4)	22,35	12,83	A	1.200	12	LDL/LDK
V10-414120100	11,25 / 33,06 (3,2 / 9,4)	13,01 / 41,85 (3,70 / 11,90)	9,85 / 26,03 (2,8 / 7,4)	22,35	19,18	A	1.200	12	LDL/LDK
V10-414140400	11,25 / 33,06 (3,2 / 9,4)	13,01 / 41,85 (3,70 / 11,90)	9,85 / 26,03 (2,8 / 7,4)	22,35	22,36	A	1.220	12	LDL/LDK
V10-418140100	11,25 / 37,63 (3,2 / 10,7)	13,01 / 47,48 (3,70 / 13,50)	9,85 / 29,54 (2,8 / 8,4)	28,78	22,36	A	1.310	12	LDL/LDK
V10-418120100	11,25 / 37,63 (3,2 / 10,7)	13,01 / 47,48 (3,70 / 13,50)	9,85 / 29,54 (2,8 / 8,4)	28,78	19,18	A	1.310	12	LDL/LDK
V10-414100100	11,25 / 33,06 (3,2 / 9,4)	13,01 / 41,85 (3,70 / 11,90)	9,85 / 26,03 (2,8 / 7,4)	22,35	16,03	A	1.200	12	LDL/LDK
V10-414120200	17,23 / 33,06 (4,9 / 9,4)	19,73 / 41,85 (5,61 / 11,90)	14,42 / 26,03 (4,1 / 7,4)	22,35	19,18	A	1.190	12	LDL/LDK
V10-4180M0200	17,23 / 37,63 (4,9 / 10,7)	19,73 / 47,48 (5,61 / 13,50)	14,42 / 29,54 (4,1 / 8,4)	28,78	19,05 O.D.	A	1.300	12	LDL/LDK
V10-418100200	17,23 / 37,63 (4,9 / 10,7)	19,73 / 47,48 (5,61 / 13,50)	14,42 / 29,54 (4,1 / 8,4)	28,78	16,03	A	1.300	12	LDL/LDK
V10-418120200	17,23 / 37,63 (4,9 / 10,7)	19,73 / 47,48 (5,61 / 13,50)	14,42 / 29,54 (4,1 / 8,4)	28,78	19,18	A	1.300	12	LDL/LDK
V10-418140200	17,23 / 37,63 (4,9 / 10,7)	19,73 / 47,48 (5,61 / 13,50)	14,42 / 29,54 (4,1 / 8,4)	28,78	22,36	A	1.300	12	LDL/LDK
V12-4220T0200	22,86 / 46,78 (6,5 / 13,3)	26,38 / 58,91 (7,50 / 16,75)	18,99 / 36,93 (5,4 / 10,5)	35,13	28,58 O.D.	F	2.030	6	LDL/LDK

**4-way Reversing Valves is the key component to provide Heating and Coling from the system to be conditioned space by reversing the flow direction of refrigerant.**

**It is used at room conditioners, packaged and central air conditioners.**

**Reversing Valves are designed for Heat Pump Systems with capacity from 0.75HP to 8HP.**

**They are suitable for most refrigerant as R22 - R410A - R407C**

## VH-Series



Part Number	R407C kW min/max (US ton min/max)	R410A kW min/max (US ton min/max)	R134A kW min/max (US ton min/max)	C.T.S.		Style	Mass (W/O coil)	Wty/box	Coil
				S.E.T. mm	Discharge mm				
VH5110D	15,83 / 54,51 (4,50 / 15,50)	--- / ---	0,00 / 0,00	28,58	22,23	C	1.350	12	LB6
VH10110	17,59 / 72,45 (5,00 / 20,60)	--- / ---	13,72 / 54,16 (3,90 / 15,40)	31,75	25,40	C	3.900	1	LB6
VH10112	17,59 / 72,45 (5,00 / 20,60)	--- / ---	13,72 / 54,16 (3,90 / 15,40)	34,93	28,58	C	3.900	1	LB6
VH15101	26,38 / 108,68 (7,50 / 30,90)	--- / ---	20,40 / 81,24 (5,80 / 23,10)	38,10	31,75	C	3.300	1	LB6
VH15102	26,38 / 108,68 (7,50 / 30,90)	--- / ---	20,40 / 81,24 (5,80 / 23,10)	38,10	31,75	C		1	LB6
VT05100	26,38 / 108,68 (7,50 / 30,90)	26,38 / 122,39 (7,50 / 34,80)	20,40 / 81,24 (5,80 / 23,10)	38,30	32,00	C	3.300	1	LB6
VH90110	35,17 / 181,13 (10,00 / 51,50)	--- / ---	27,08 / 135,40 (7,70 / 38,50)	53,98	38,10	C	7.600	1	LB6
VH20311	35,17 / 144,90 (10,00 / 41,20)	--- / ---	27,08 / 108,32 (7,70 / 30,80)	44,45	38,10	C	7.500	1	LB6
VH20312	35,17 / 144,90 (10,00 / 41,20)	--- / ---	27,08 / 108,32 (7,70 / 30,80)	41,28	41,28	C	7.500	1	LB6
VH91110	42,20 / 217,35 (12,00 / 61,80)	--- / ---	32,36 / 162,49 (9,20 / 46,20)	66,68	41,28	C	8.200	1	LB6
VH31085	70,34 / 289,80 (20,00 / 82,40)	--- / ---	54,16 / 216,65 (15,40 / 61,60)	Frang RBK 65A	Frang RBK 50A		55.000	1	LB6
VH31123	105,51 / 436,11 (30,00 / 124,00)	--- / ---	81,24 / 324,97 (23,10 / 92,40)	Frang RBK 65A	Frang RBK 50A		73.000	1	LB6
VH31163	140,68 / 579,60 (40,00 / 164,80)	--- / ---	108,32 / 432,59 (30,80 / 123,00)	Frang RBK 65A	Frang RBK 50A		82.000	1	LB6

## N-Series

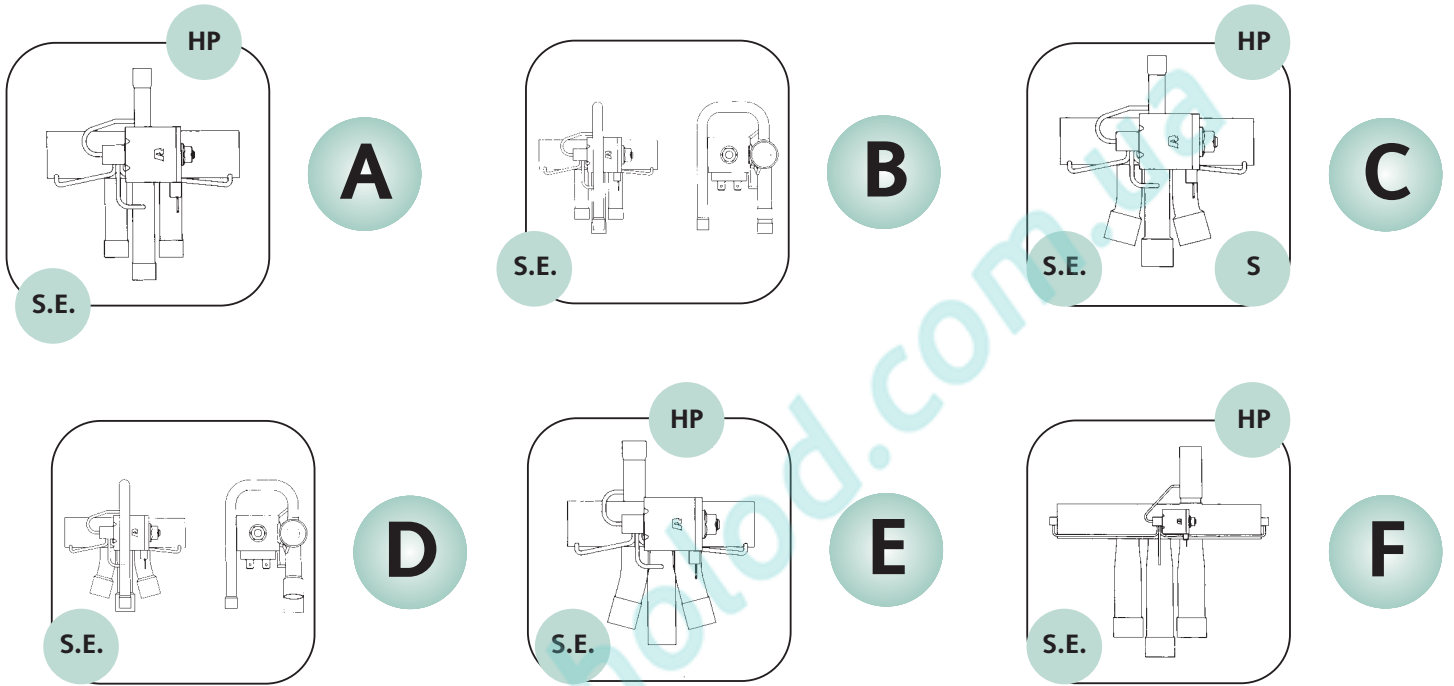
Part Number	R407C kW min/max (US ton min/max)	R410A kW min/max (US ton min/max)	R134A kW min/max (US ton min/max)	C.T.S.		Style	Mass (W/O coil)	Qty/box	Coil
				S.E.C.	Discharge				
N15C00S	15,83 / 54,51 (4,50 / 15,50)	15,83 / 61,55 (4,50 / 17,50)	12,31 / 40,80 (3,5 / 11,6)	28,80	22,40	A		?	LDL/LDK
N20C00G	0,00 / 0,00	17,60 / 81,60 (5,00 / 23,20)	0,00 / 0,00	32,00	25,60	A	3.300	1	LDL/LDK
N30C00G	0,00 / 0,00	26,40 / 122,40 (7,51 / 34,80)	0,00 / 0,00	38,00	32,00	A	3.300	1	LDL/LDK
N40C10G	0,00 / 0,00	35,20 / 163,20 (10,01 / 46,40)	0,00 / 0,00	45,00	38,10	A	7.500	1	LDL/LDK
N50C10G	0,00 / 0,00	35,20 / 204,00 (10,01 / 58,00)	0,00 / 0,00	54,20	38,10	A	7.600	1	LDL/LDK

## AVAILABLE TUBE CONFIGURATIONS





# AVAILABLE TUBE CONFIGURATIONS



HP	High Pressure	S	Suction
S.E.	Connected to High Pressure when Solenoid is Energized		



## DESCRIPTION / APPLICATION

These solenoid operated Reversing Valves are slide type, 4-way with a 4-way Pilot valve and operate under the full pressure of the heat pump system.

The valves are used on unitary, split system, and window-type heat pump applications. There are six different styles designed to meet your particular system need.

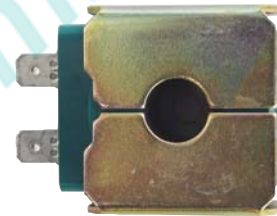
## Solenoid Coils

### CHOOSING THE CORRECT SOLENOID COIL

RANCO offers Type LDK solenoid coils for use with the V1-4/V2-4/V3-4/V6-4/V10-4/V12-4 RANCO Heat Pump Reversing Valves. These color coded epoxy encapsulated, continuous duty, moisture resistant magnetic coils are designed to operate the pilot valve controlling the Reversing Valves listed above. Included with the solenoid coil is a W29 wiring harness with 48" leads.

Coil Type	Color	Voltage	Frequency	Wattage 50/60 Hz	VA 50/60 Hz	UL Thermal Class
LDK-11	Red	24 V	50/60 Hz	5/4	11,9 / 9,6	A
LDK-31	Black	120 V	50/60 Hz	5/4	11,0 / 8,7	A
LDK-41	Green	208 / 240 V	50/60 Hz	5/4	9,5 / 7,8	A
LDK-51	Blue	277 V	50/60 Hz	5/4	10,5 / 8,3	A
LDK-73	Yellow	12 V	-	10	-	F
LDK-83	Orange	24 V	-	10	-	F

Coil Type	Color	Voltage	Frequency	Wattage 50/60 Hz	VA 50/60 Hz	UL Thermal Class
LDL-11	Red	24 V	50/60 Hz	5/4	11,9 / 9,6	A
LDL-31	Black	120 V	50/60 Hz	5/4	11,0 / 8,7	A
LDL-41	Green	208 / 240 V	50/60 Hz	5/4	9,5 / 7,8	A
LDL-51	Blue	277 V	50/60 Hz	5/4	10,5 / 8,3	A



## NOTICE

Heat pumps and heat/cool units – many original equipment manufacturers connect the system tubing to the Ranco reversing valve based on which mode (heat or cool) the system will operate should the solenoid coil fail.

For example, solenoid coil energized for cooling (Figure 1); solenoid coil failure mode to heat cycle. Solenoid coil energized for heating (Figure 2); solenoid coil failure mode to cooling cycle. Prior to replacing the valve, confirm which mode (heat or cool) the solenoid coil controls when energized.

Figure 1

Viewed facing three tubes and solenoid on right.

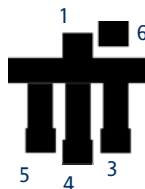
Solenoid coil fails, cycle goes to heating. Solenoid coil energized for cooling (de-energized for heat); solenoid fails, valve goes to heat cycle.



Figure 2

Viewed facing three tubes and solenoid on right.

Solenoid coil fails, cycle goes to cooling. Solenoid coil energized for heat (de-energized for cooling); solenoid fails, valve goes to cooling cycle.



1. Connects to Compressor Discharge
2. Solenoid Coil Energized for Cooling
3. Connects to Outside Condenser
4. Connects to Suction Line
5. Connects to Inside Evaporator (coil)
6. Solenoid Coil Energized for Heat

### RANCO REVERSING VALVE OPERATING SPECIFICATION

Min. Δ P to Reverse	15 psi
Max. Δ P to Reverse	440 psi
Max. Pressure	680 psi
Min. Burst Pressure	2500 psi
Max. Operating Temper.	250°F Min.
Life Cycles	135,000
Min. Operating Voltage	85% of Rated Volts
Max. Operating Voltage	110% of Rated Volts
Max. Leakage to Suction:	
V1-4/V2-4/V3-4	2,000 cc/min.
V6-4	4,000
V10-4	6,000
V12-4	15,000

Note: Dry Air at 150 psi, Valve at 160°F. Air at 70°F.

# Intallation and Cautions

## Main Valve Installation

- Please avoid moisture and impurity getting into valve
- Please do not drop the valve. Avoid deforming coppers tubes or damaging of other structure
- Please do not drop the valve. Avoid deforming coppers tubes or damaging of other structure

## Coil Installation

- Please do not drop the valve. Avoid deforming coppers tubes or damaging of other structure
- Please do not drop the valve. Avoid deforming coppers tubes or damaging of other structure
- Please do not drop the valve. Avoid deforming coppers tubes or damaging of other structure

## REPLACING VALVE ASSEMBLY

SYSTEM REPAIR - Follow the original equipment manufacturer's recommendations for replacement of refrigerant components.

SYSTEM EVACUATION - Follow original equipment manufacturer's recommendations and/or RSES SAM Section 83 (630-46).

COMPRESSOR MOTOR BURNOUT - Follow original equipment manufacturer's recommendations and/or RSES SAM Section 91.

### CAUTION

To prevent possible electrical shock or equipment damage, disconnect electrical power to unit before and during installation. DO NOT restore electrical power to unit until the device is properly installed.

### GENERAL INSTALLATION PROCEDURES - REMOVAL

- Use only an oxy-acetylene torch to unsolder connections. Other type torches may not have the heat capacity to do the job with minimum time and temperature.
- Protect the valve from excessive heat. Temperatures above 250°F are apt to damage internal parts. Wrapping a wet rag around the valve body while using the torch will help to dissipate heat.
- Inadequate heat is also a problem. Not only will the soldered joints be difficult to separate, but also the build up of heat over the longer period of time required will transfer to the valve body and possibly damage its internal parts.
- The joint should separate in seconds, not minutes. Use enough heat to accomplish this, while relying on the wet rag to protect the valve body. Also remember that the remelt temperature of any solder alloy is much higher than the initial soldering temperature.
- After removing the valve, inspect the lines to make sure they are round and do not have any large solder blobs, which will interfere with the mechanical fit of the new joints.

### VALVE INSTALLATION

- Avoid any rough handling of the new valve during installation. This especially includes the use of vise-type pliers to manipulate the valve body while

### CAUTION

Protect tubes from entry of all foreign matter such as moisture, metal filings, dust or dirt. It takes only a tiny bit of scale, flux, lint or the like to clog a pilot valve

- Use wet rags around the valve body and adjoining tubing to prevent overheating. Direct the flame of the torch away from the valve body. Excess heat over 250°F may distort internal parts.
- Use low temperature brazing rod as local code will permit, and use an inert gas to prevent oxide scale on the inside of the tubing.
- Preferably use a phosphorus-bearing silver solder which requires no external flux. The entrance of even a tiny bit of flux may be enough to damage a new valve
- If you must use silver solder with externally applied flux, be sure the sections to be joined are bright and clean and that you use the flux sparingly. This will do the job, but because this kind exceptional skill and care in its use, most valve manufacturers are reluctant to recommend it.

rel. x-05  
cod. CT

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