

INSTRUCTION MANUAL

SCHULZ

Serial n° _____

Model n° _____

ISO
9001

SCHULZ

QUALITY SYSTEM CERTIFIED

ISO
14001

SCHULZ

ENVIRONMENTAL MANAGEMENT SYSTEM

ROTARY SCREW COMPRESSOR

SRP 3015 SRP 3020

SRP 3030 SRP 3050

Visit website

www.schulzamerica.com

ATTENTION

The Warranty on your SCHULZ compressor will only be effective following the receipt of the warranty registration form completed by a SCHULZ Authorized-Technical/Distributor.

See Warranty Registration Form (Page 41).
SCHULZ OF AMERICA, Inc.

IMPORTANT

This Instruction Manual contains important use, installation, maintenance and safety information and should always be available to the machinery operator. To prevent personal injuries or material damage to your rotary screw compressor, always familiarize yourself with the contents of this manual before operating or maintaining your equipment.

IMPORTANT

Use only SCHULZ original parts for your rotary screw compressor maintenance. These are available through your SCHULZ Authorized-Technical/Distributor. See table 6 (page 35).

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Enclosed Document:

Hidrostatic Test Sheet/Instruction Electric Motor

SCHULZ

INSTRUCTION MANUAL SCREW AIR COMPRESSOR

SRP 3015 SRP 3020
SRP 3030 SRP 3050

WELCOME TO THE WORLD OF SCHULZ TECHNOLOGY

Congratulations on your purchase of a SCHULZ quality product.

A company with a Quality System certified: **ISO 9001** environmental management system: **ISO 14001**

Scope of supply - design, development and manufacture of air compressors and pressure vessels for compressed air - Joinville's plant - Brazil.

The design, inspection and manufacturing of your SCHULZ receiver is according to ASME, Section VIII, Div. 1.

SCHULZ products blend high technology with easy use.

INTRODUCTION

Instruction Manual



PLEASE READ THIS MANUAL CAREFULLY.

It will help you guide you in the installation, use and maintenance of your equipment.

If you encounter a question that is not answered by the manual, please feel free to contact your nearest SCHULZ Authorized - Technical/Distributor for assistance.

Warranty

To maintain the SCHULZ warranty and to ensure your equipment's safe operation, the exclusive use of SCHULZ original parts and oil **SCHULZ LUBE SH 46** lubricant is required.

Repairs

Any repairs must be made by SCHULZ Authorized-Technical/Distributor. Following any repair or maintenance, make the appropriate annotations in the equipment Service Log supplied in this manual (page 39).

Inquiries

When addressing questions to the SCHULZ service center, please refer to the model and serial numbers of your machine. They can be found on the air end and inside the electrical control cabinet.

Installation

It is the end user's responsibility to install, inspect, maintain, operate and provide specific documentation for the compressor and air/oil receiver as required by applicable federal, state and local legislation

COMPRESSOR INSPECTION

Immediately inspect your compressor for both obvious and unseen freight damage. Report this to the freight company immediately! Repair any freight damage before operating the air compressor.

USE

SCHULZ air compressors are designed for the compression of atmospheric air only and within the pressure parameters indicated in the SCHULZ literature.

SAFETY
A WARNING

Keep these Instructions

Improper installation or improper use of this equipment can result in personal injury and material damage. In order to avoid injury or damage, please adhere to the following recommendations:

1. This equipment presents the following hazards:



- extremely hot parts, energized electrical components, compressed air parts and moving parts;

- the compressor has high and dangerous voltage in the motor, the starter and control box. All installations must be in accordance with recognized electrical procedure. Before working on the electrical system, ensure that the system's power has been shut off by use of a manual disconnect switch. A circuit breaker or fuse switch must be provided in the electrical supply line to be connected to the compressor. The preparation work for installation of this unit must be done in suitable grounds, maintenance clearance and lighting arrestors for all electrical components.



- turns on or off automatically relative to system pressure or actuation of the thermal protection elements;



- may cause mechanical or electrical interference in nearby equipment;



- installation must be protected from access by unauthorized persons, children or animals;

- operate and maintain this equipment with appropriate supervision and appropriate use of personal protective equipment;



- unit must be installed and operated in well ventilated areas with protection from elements;

2. Never attempt to exceed the maximum operating pressure indicated on the compressor.

3. Do not attempt maintenance before disconnecting the electrical power supply.

4. Do not adjust the safety valve and pressure switch. They are permanently adjusted at the factory.



5. Do not attempt to repair or air/oil receiver. Certification and operation receiver may be adversely affected. Consult your SCHULZ Authorized-Technical/Distributor.

6. Never run the air/oil receiver above the maximum pressure indicated in its identification tag.

7. **The end user must have a new inspection in the air/oil receiver carried out after 5 years from the manufacturing date shown in its identification tag. This inspection must be made and approved by an authorized engineer (skilled professional), according to local technical norms. We recommend the replacement of the receiver for a new one every ten years.**



8. Air compressing is a heat generating process. Surfaces and parts are subject to high temperatures, therefore, to avoid burns, be careful when handling them.



9. **The compressed air would contain damages contaminants to the human, animal, ambient or nourishing health, among others. The compressed air must be treated with adjusted filters, as requisite of its application and use. Get more information about it at Schulz Authorized-Technical/Distributor or the factory (sales@schulzamerica.com).**

10. Before connecting the compressor re-fastening of the electrical connection.

11. Keep the refrigeration air inlet always clean, to prevent the propeller from sucking remains (item 16, Figures 3 up to 6, pages 5 and 6).

12. Never use solvent to clean the compressor's internal/external parts. Use neutral detergent.



13. Never activate the safety valve if the compressor is operating/pressurized, to avoid burns.










14. Avoid the accumulation of solvents, paints or other chemicals that can cause explosion risks, or compressor damage.



15. Do not carry out maintenance jobs with the compressor on. For safety reasons, press the emergency button **8** (Figures 25 to 27, page 25) located in the instrument panel.

16. If the equipment shows any irregularities, stop its operation immediately and get in touch with the nearest SCHULZ Authorized-Technical/Distributor.

TECHNICAL DATA

MODELS		SRP 3015			SRP 3020		
 WORKING PRESSURE	barg/psig	7.5/108	8.6/125	11/160	7.5/108	8.6/125	11/160
	cfm	59	54	45	84	79	63
	l/min	1,671	1,530	1,274	2,378	2,240	1,784
 RPM	Male rotor	6,210	5,900	4,330	8,300	7,990	7,100
DRIVING METHOD		V - Belt (3VX x 2)			3VX x 4		
 MAIN MOTOR	hp / kW	15 / 11.25			20 / 15		
	Voltage (V)	208 - 230 / 460			208 - 230 / 460		
	RPM - Frequency (Hz)	3,550 - 60			3,550 - 60		
 FAN S MOTOR	Start Mode	Direct Start			Direct Start		
	hp / kW	0.14 / 0.19			-		
	Voltage (V)	230			230		
 CONTROL VOLTAGE	RPM	2900			3560		
	Vca	24			24		
 TEMPERATURE	Allowed ambient temperature	0 - 45			0 - 45		
		32 - 113			32 - 113		
	Discharge air temperature	Inlet air temperature + 15°C			Inlet air temperature + 15°C		
 AIR REFRIGERATED COMPRESSOR	Air intake dimension (inch)	Inlet air temperature + 27°F			Inlet air temperature + 27°F		
		12 x 12			22 x 13		
	Air outlet dimension (inch)	13 x 14			17 x 26		
 OIL LUBRICANT	Cap (gal)	1.37			3.49		
	Denomination	SCHULZ LUBE SH 46			SCHULZ LUBE SH 46		
	AIR OUTLET PIPING SIZE	3/4			3/4		
 WEIGHT	Kg/lb	300 / 660			256 / 563		










MODELS		SRP 3030			SRP 3050		
 WORKING PRESSURE	barg/psig	7.5/108	8.6/125	11/160	7.5/108	8.6/125	11/160
	cfm	124	112	97	224	212	185
	l/min	3,511	3,170	2,747	6,354	6,000	5,245
 RPM	Male rotor	4,800	4,450	4,050	4,400	4,200	3,700
DRIVING METHOD		V - Belt (3VX x 4)			POLY V (18L)		
 MAIN MOTOR	hp / kW	30 / 22.5			50 / 37.5		
	Voltage (V)	208 - 230 / 460			208 - 230 / 460		
	RPM - Frequency (Hz)	3,550 - 60			3,550 - 60		
 FAN S MOTOR	Start Mode	Direct Start			Star-Delta Start		
	hp / kW	185			1250		
	Voltage (V)	230			230		
 CONTROL VOLTAGE	RPM	1690			1440		
	Vca	24			24		
 TEMPERATURE	Allowed ambient temperature	0 - 45			0 - 45		
		32 - 113			32 - 113		
	Discharge air temperature	Inlet air temperature + 15°C			Inlet air temperature + 15°C		
 AIR REFRIGERATED COMPRESSOR	Air intake dimension (inch)	Inlet air temperature + 27°F			Inlet air temperature + 27°F		
		38 x 20			26 x 14		
	Air outlet dimension (inch)	17 x 26			28 x 30		
 OIL LUBRICANT	Cap (gal)	3.49			5.6		
	Denomination	SCHULZ LUBE SH 46			SCHULZ LUBE SH 46		
	AIR OUTLET PIPING SIZE	3/4			1.1/2		
 WEIGHT	Kg/lb	390 / 858			790 / 1738		

TABLE 1 - TECHNICAL DATA

TECHNICAL DATA

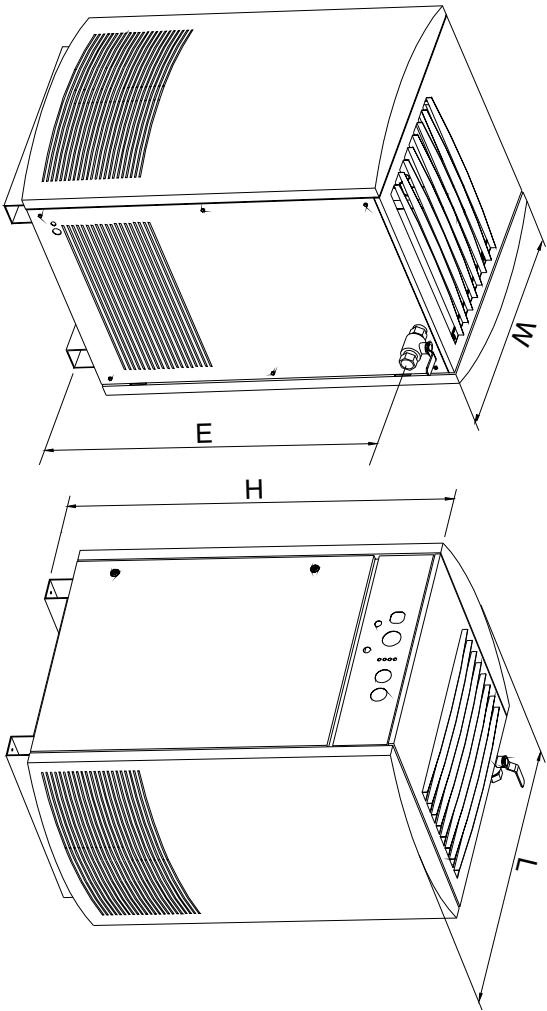


FIGURE 1

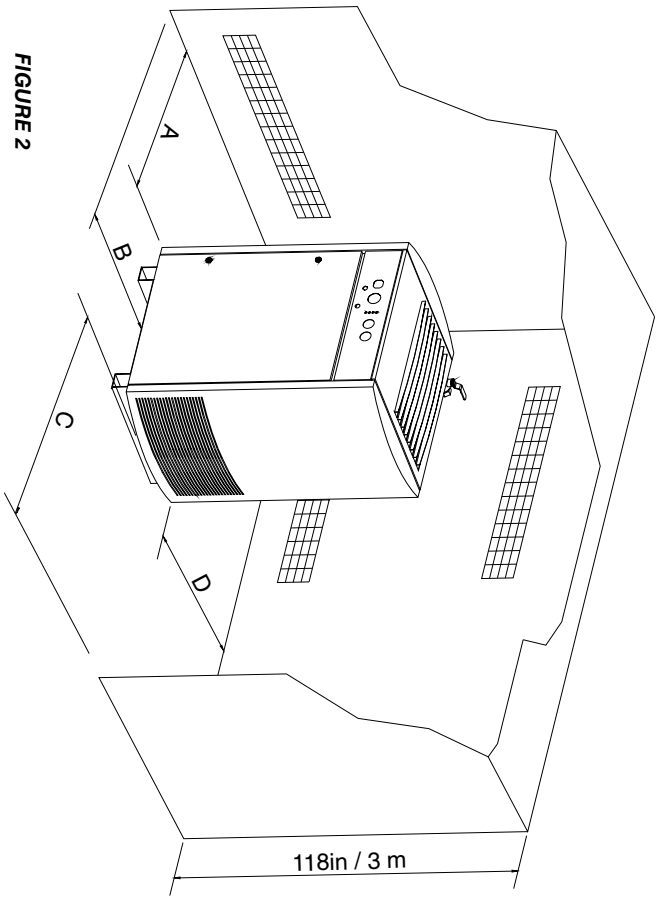


FIGURE 2

Models	A	B	C	D	E	W	L	H
SRP 3015	39	39	39	39	13	26.7	45.6	55
SRP 3020	39	39	78	39	49.8	31.6	40.1	52.1
SRP 3030	39	39	39	78	49.8	31.6	40.1	52.1
SRP 3050	59	59	59	59	69	37	53.9	61.4

* Dimensions (in).

MAIN COMPONENTS

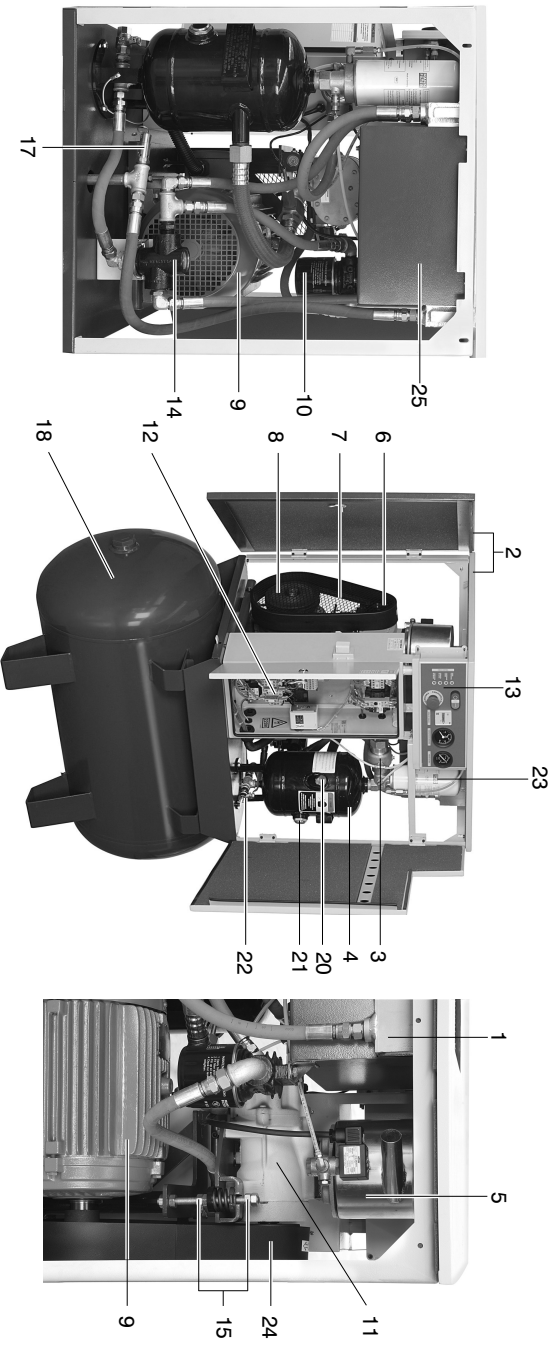


FIGURE 3 - SRP 3015

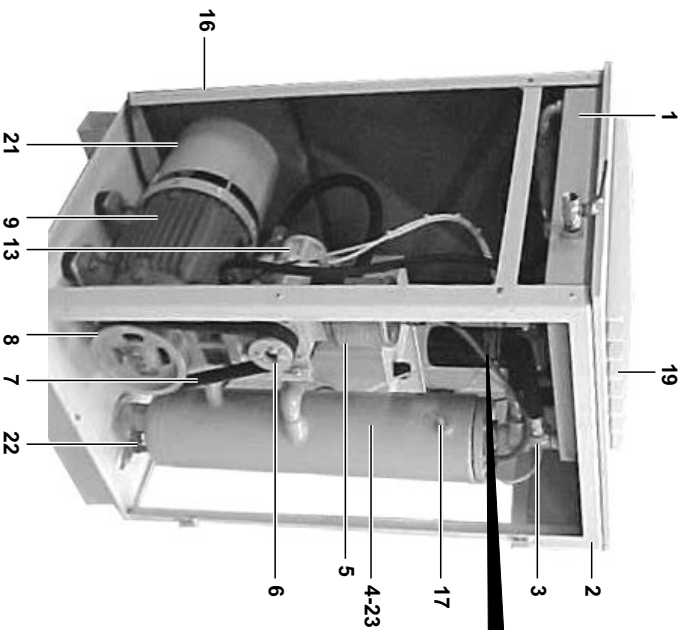
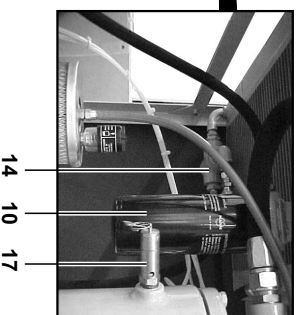


FIGURE 4 - SRP 3020



1. Aftercooler
2. Cabinet
3. Minimum pressure check valve
4. Air/oil receiver
5. Air filter/air inlet valve
6. Pulley
7. Belt
8. Pulley (motor)
9. Electric motor
10. Oil filter
11. Air end
12. Control panel
13. Instrument panel (Figures 25 up to 27, page 25)

14. Thermostatic valve
15. Belt tensiometer
16. Cooling air inlet
17. Safety valve
18. Receiver
19. Hot air outlet
20. Oil replacement plug
21. Oil level sight gauge
22. Oil drain valve
23. Air/oil separator element
24. Belt guard
25. Box with fan
26. Relief valve

MAIN COMPONENTS

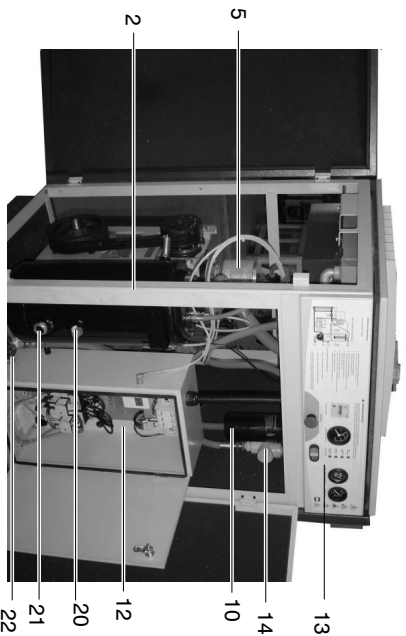


FIGURE 5 - SRP 3030

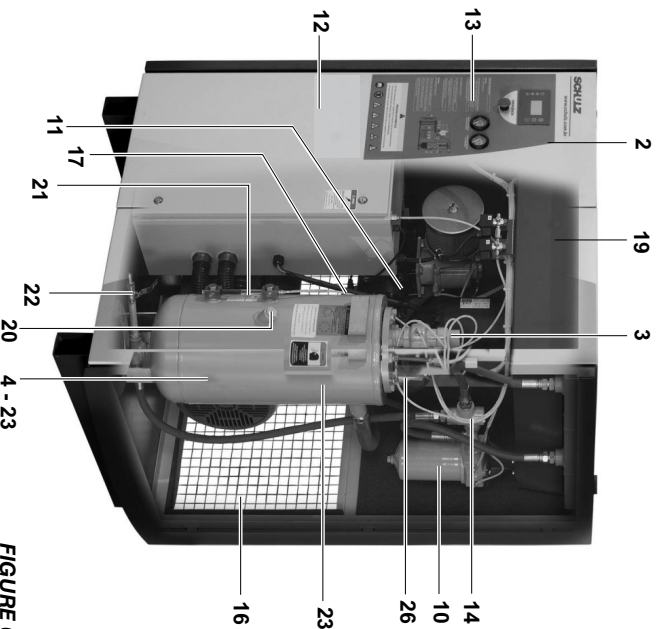
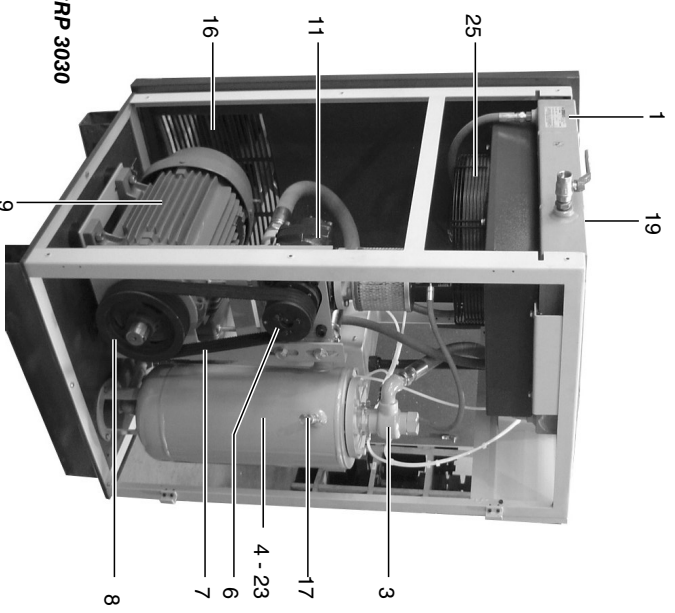
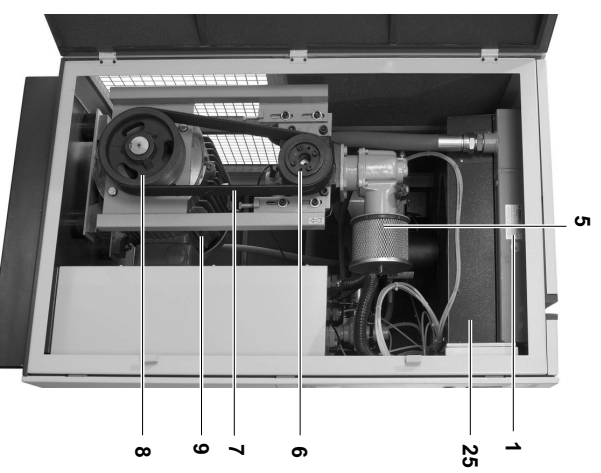


FIGURE 6 - SRP 3050



1. Aftercooler
2. Cabinet
3. Minimum pressure check valve
4. Air/oil receiver
5. Air filter/air inlet valve
6. Pulley
7. Belt
8. Pulley (motor)
9. Electric motor
10. Oil filter
11. Air end
12. Control panel
13. Instrument panel (Figures 25 up to 27, page 25)

14. Thermostatic valve
15. Belt tensiometer
16. Cooling air inlet
17. Safety valve
18. Receiver
19. Hot air outlet
20. Oil replacement plug
21. Oil level sight gauge
22. Oil drain valve
23. Air/oil separator element
24. Belt guard
25. Box with fan
26. Relief valve

INSTALLATION

1. Location:

Install the compressor in a covered, well ventilated area, free from dust gases, toxic gases, humidity or any other sources of contamination. The presence of contaminants in the air (dust, fibers, etc.) may cause premature obstruction to the air filter and the air/oil after-cooler (please see chapter on Preventive Maintenance, pages 30 and 32, items **2.1.3** and **4**). Chemical gases may pass through the air inlet filter and contaminate the oil, causing lubricating problems and diminished air quality. For installation in highly contaminated areas, a heavy duty remote air inlet filter kit can be purchased and installed. (Consult your SCHULZ Authorized-Technical/Distributor for price and availability). The maximum recommended working ambient temperature is 40°C (104°F). Should temperature be higher, exhaust fans or must be provided in order to bring ambient temperature to its required level. The lower the temperature, the better the compressor's working conditions. The installation of a hot air duct from the compressor's cooling air outlet may be installed. Care should be taken to insure that NO AIR FLOW RESTRICTION is created. Connection to the compressor cabinet must also be accomplished in such a manner as to insure the ease of maintenance. (Consult your SCHULZ Authorized-Technical/Distributor for assistance and recommendations).

⚠ ATTENTION

Do not install the compressor in chemically hazardous areas.

2. Position

Place compressor a minimum distance as Figure 2, page 4 from any wall or obstacle to facilitate adequate air flow and ease of maintenance.

3. Mounting

Remove compressor from pallet and crating and place it on a level concrete floor. It is not necessary to install anti-vibration devices or to anchor the frame to the floor.

4. Electrical Connection

To change the compressor voltage: call to the authorized technical assistance or the nearest Schulz dealer.

⚠ IMPORTANT

The voltage changing need to be realized by qualified people.

Before connecting electrical power supply it is recommended that internal electrical connections be checked for security following shipping. Consult a licensed electrician to evaluate power supply and install appropriate electrical connections for your air compressor.

Your compressor must be installed in accordance with federal state and local electrical codes.

Wiring must be sized appropriately to accommodate in-rush current and distance to power supply (See Table 3, page 20).

A fused disconnect (with timed delay fuses) should be installed near the compressor (see Table 2).

⚠ ATTENTION

Always check if the transformer's capacity can stand the compressor's power. If a separate transformer is not available, check whether the energy supply and main circuit breakers can stand a voltage load increase.

The electrical power supply should not have a voltage variation greater than $\pm 10\%$.

The voltage drop caused by the motor's start up should not exceed 10%.

The frame of the compressor should be grounded appropriately.

Terminal block power supply: supplies compressor according to nominal voltage indicated in the start switch cabinet.

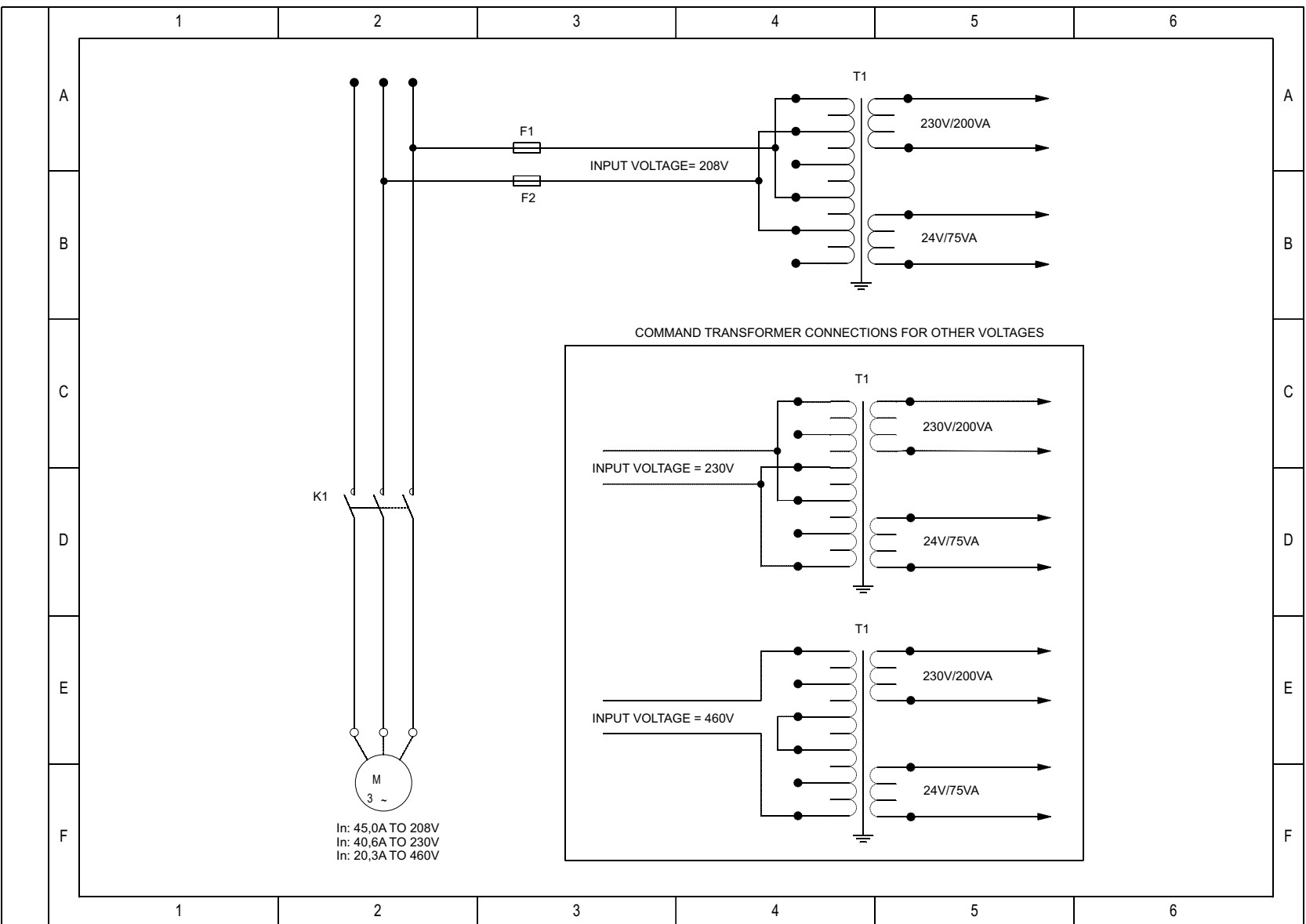
The motor starter configuration includes a thermal overload relay for the protection of the compressor and fan motors. Figures 7 to 18, pages 8 to 19, shows the power and command electric circuit and the control panel layout for all compressors models. On page 20 there are some guidelines and diagrams **A** and **B** for the capacitors installation

Control voltage for all models is 24Vac.

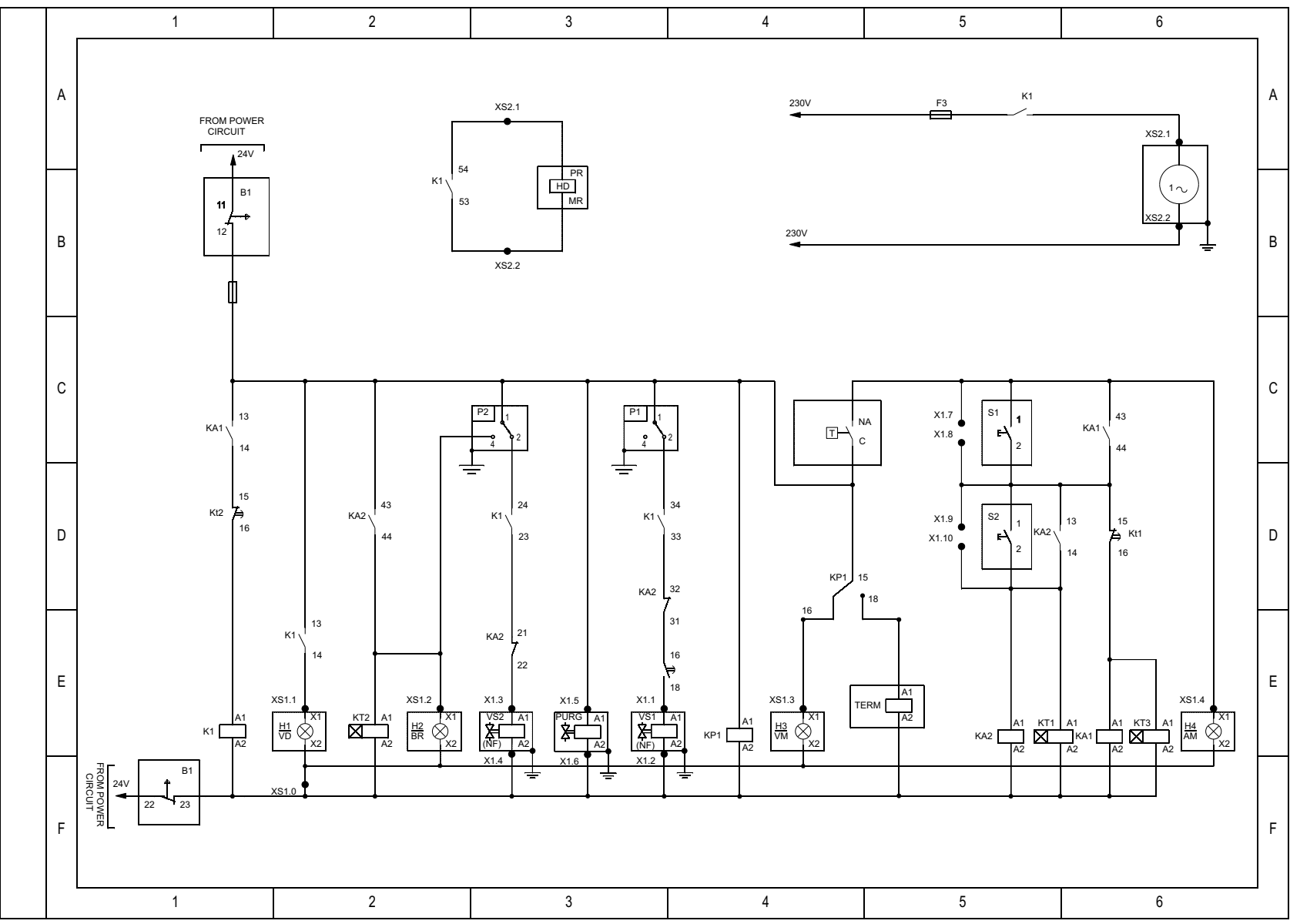
	MODEL	SRP 3015	SRP 3020	SRP 3030	SRP 3050
FUSES	VOLTAGE 208 - 230 V	100 A	125 A	2000 A	200 A
	VOLTAGE 460 V	50 A	63 A	100 A	100 A

TABLE 2 - FUSES

INSTALLATION



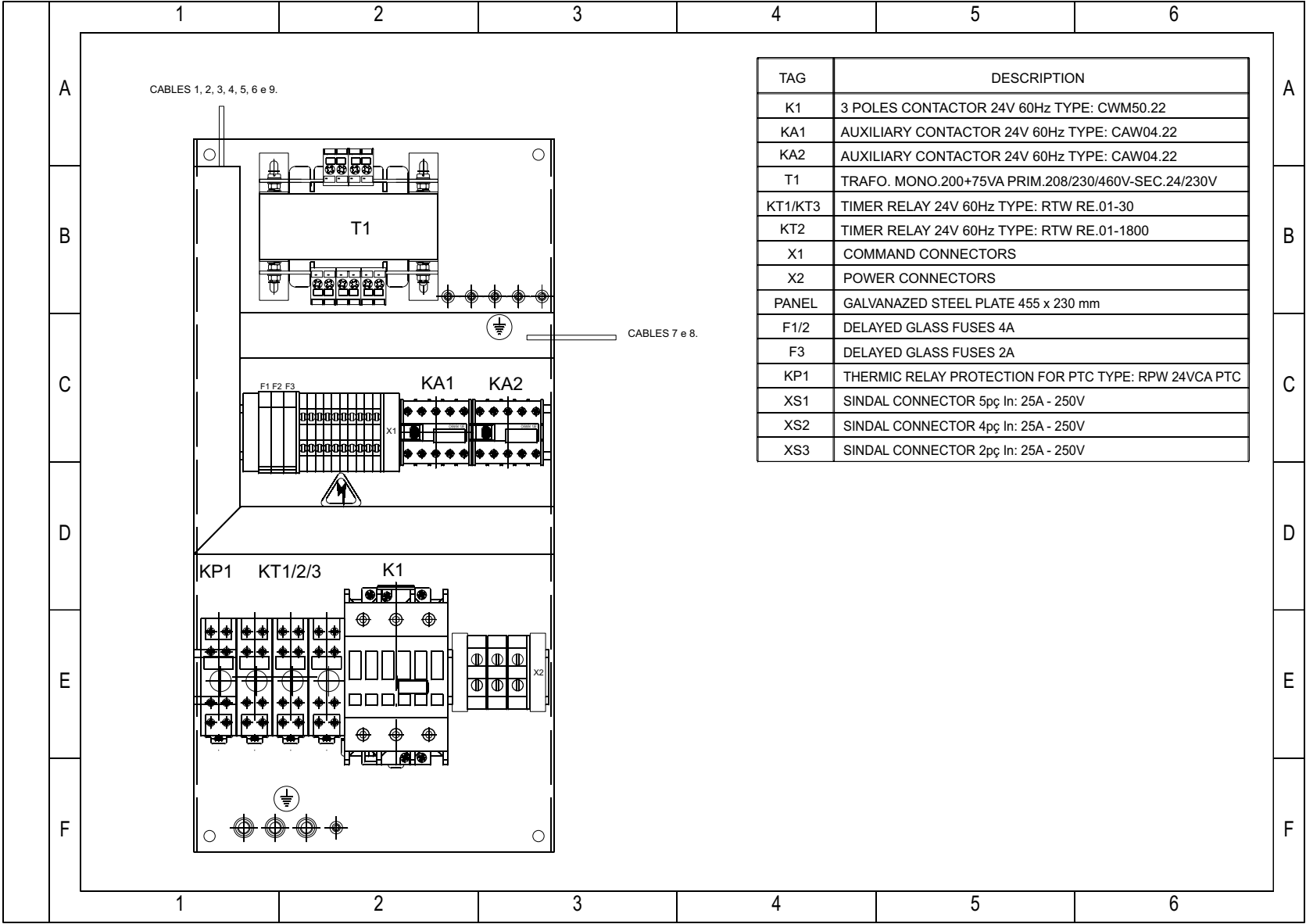
POWER CIRCUIT
SRP 3015 - DIRECT STARTER
FIGURE 7



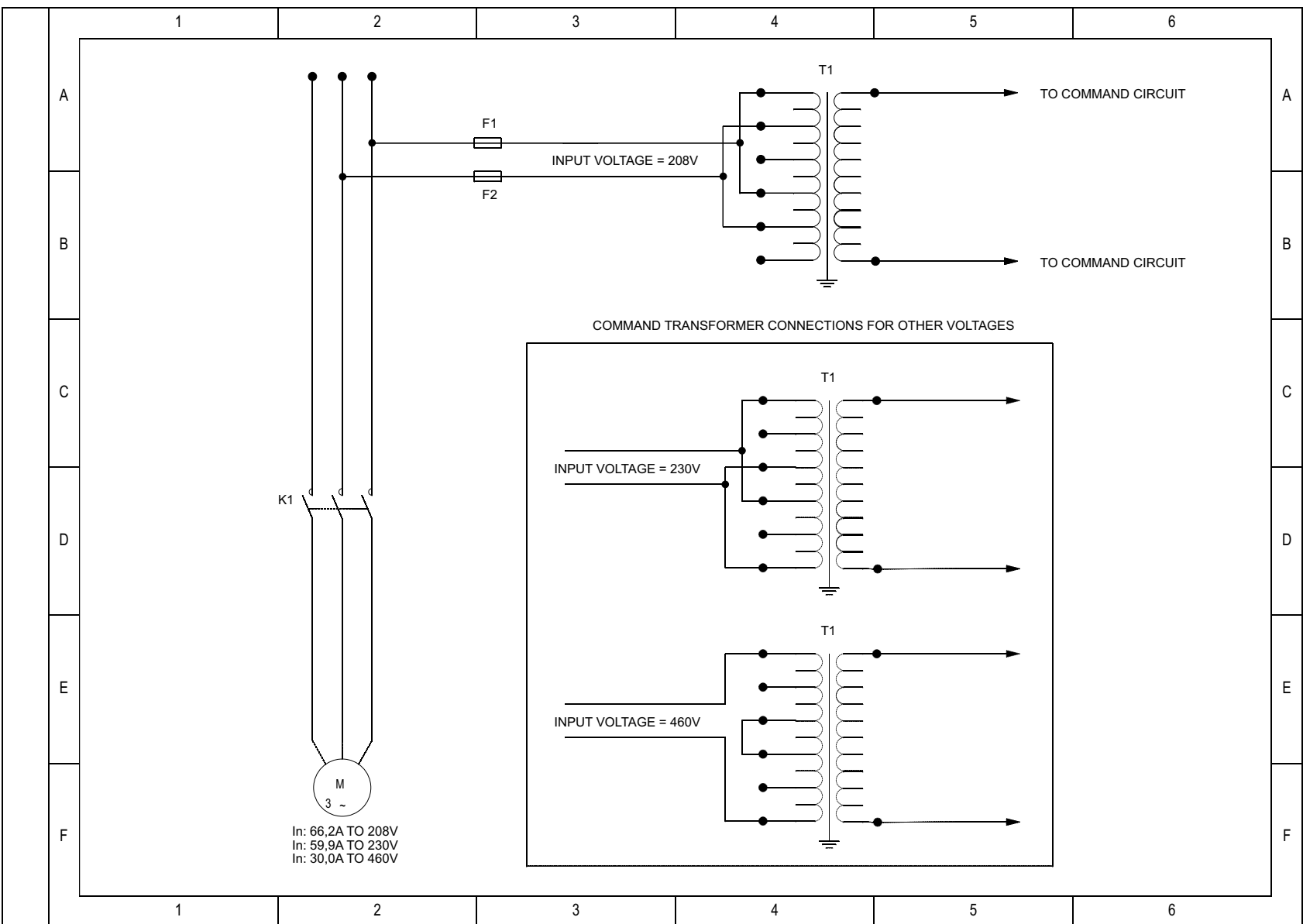
COMMAND CIRCUIT
SRP 3015 - DIRECT STARTER
FIGURE 8

INSTALLATION

TAG	DESCRIPTION
K1	3 POLES CONTACTOR 24V 60Hz TYPE: CWM50.22
KA1	AUXILIARY CONTACTOR 24V 60Hz TYPE: CAW04.22
KA2	AUXILIARY CONTACTOR 24V 60Hz TYPE: CAW04.22
T1	TRAFO. MONO.200+75VA PRIM.208/230/460V-SEC.24/230V
KT1/KT3	TIMER RELAY 24V 60Hz TYPE: RTW RE.01-30
KT2	TIMER RELAY 24V 60Hz TYPE: RTW RE.01-1800
X1	COMMAND CONNECTORS
X2	POWER CONNECTORS
PANEL	GALVANIZED STEEL PLATE 455 x 230 mm
F1/2	DELAYED GLASS FUSES 4A
F3	DELAYED GLASS FUSES 2A
KP1	THERMIC RELAY PROTECTION FOR PTC TYPE: RPW 24VCA PTC
XS1	SINDAL CONNECTOR 5pç In: 25A - 250V
XS2	SINDAL CONNECTOR 4pç In: 25A - 250V
XS3	SINDAL CONNECTOR 2pç In: 25A - 250V

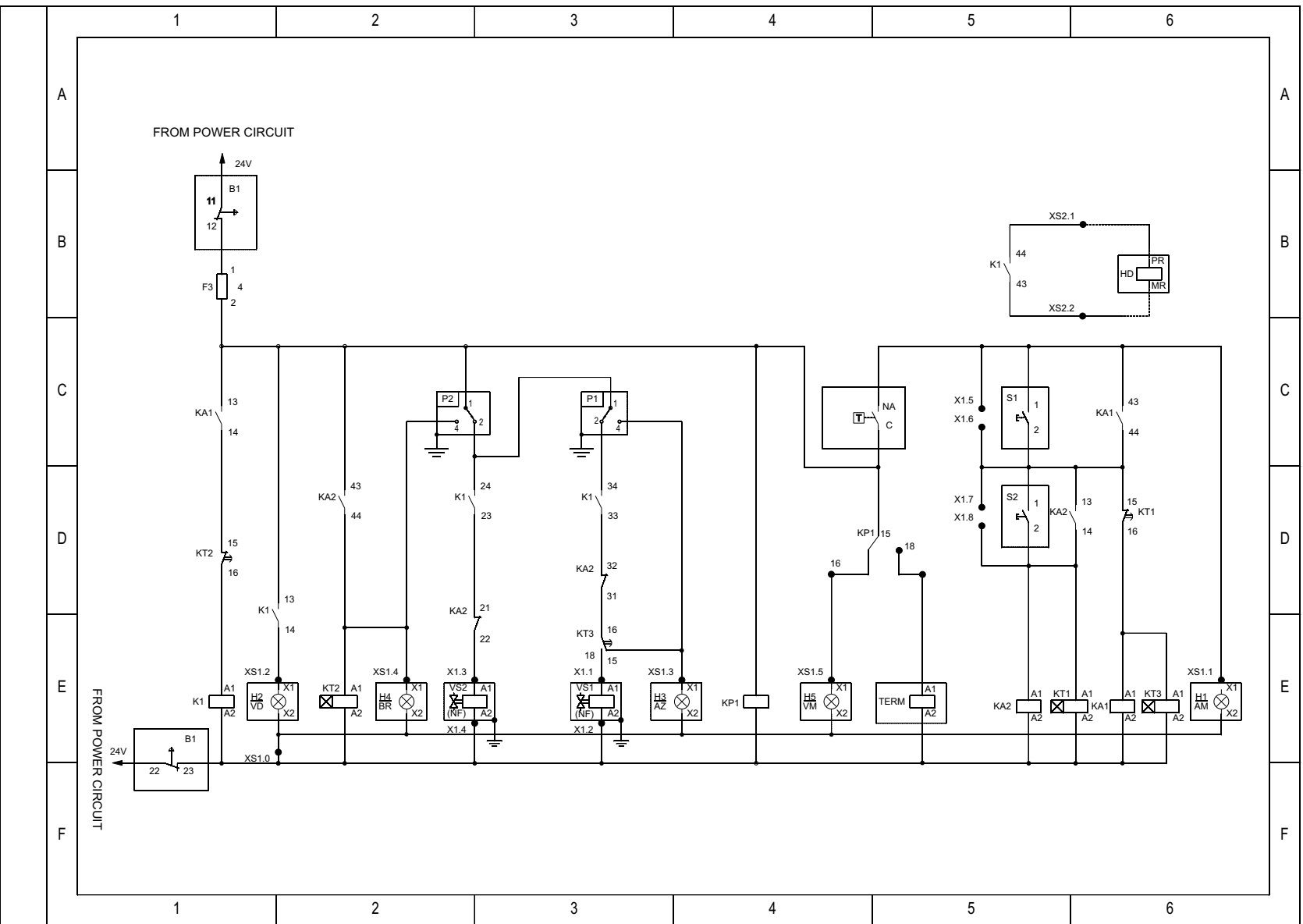


LAYOUT COMPONENTS
SRP 3015 - DIRECT STARTER
FIGURE 9

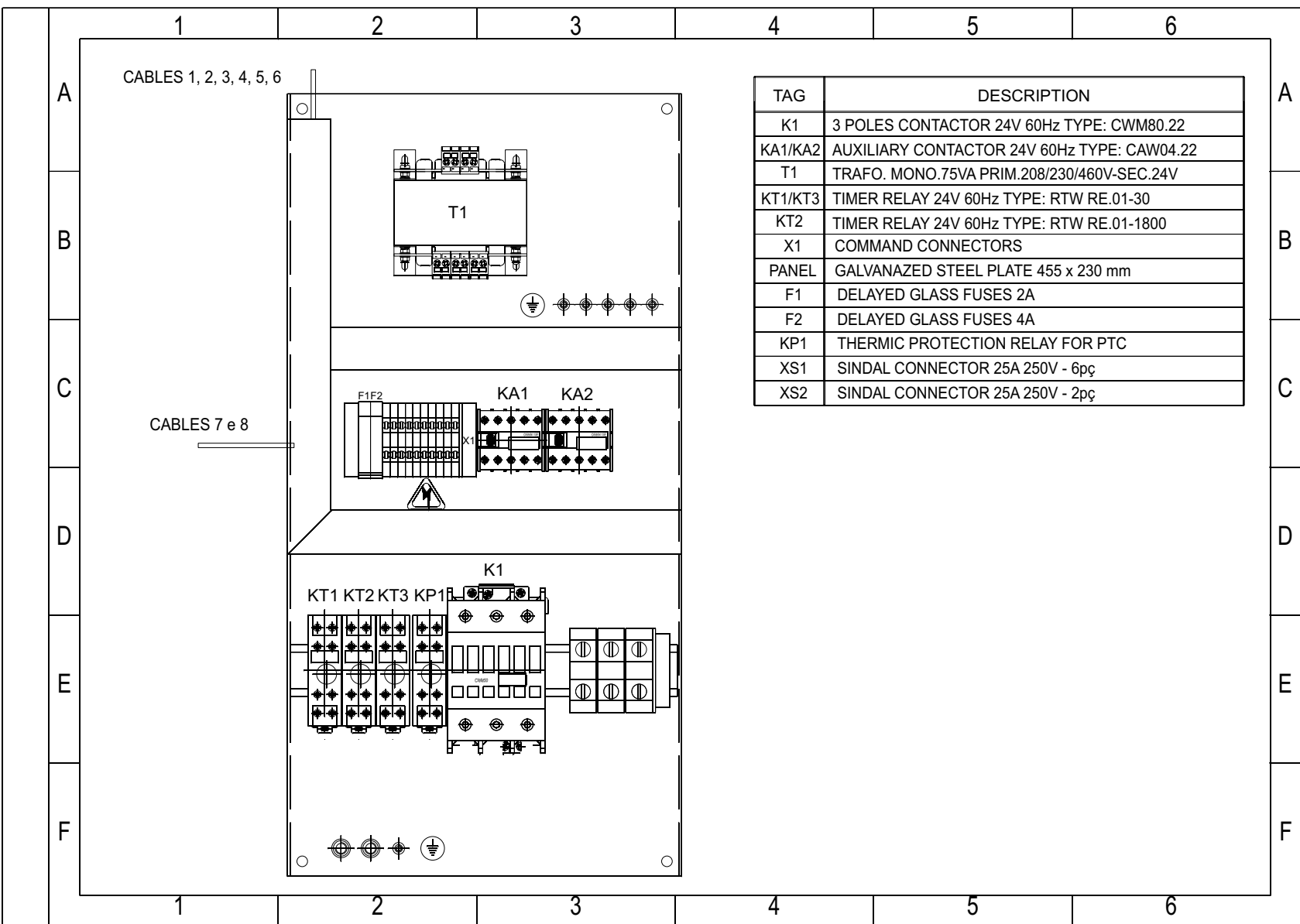


POWER CIRCUIT
SRP 3020 - DIRECT STARTER
FIGURE 10

INSTALLATION

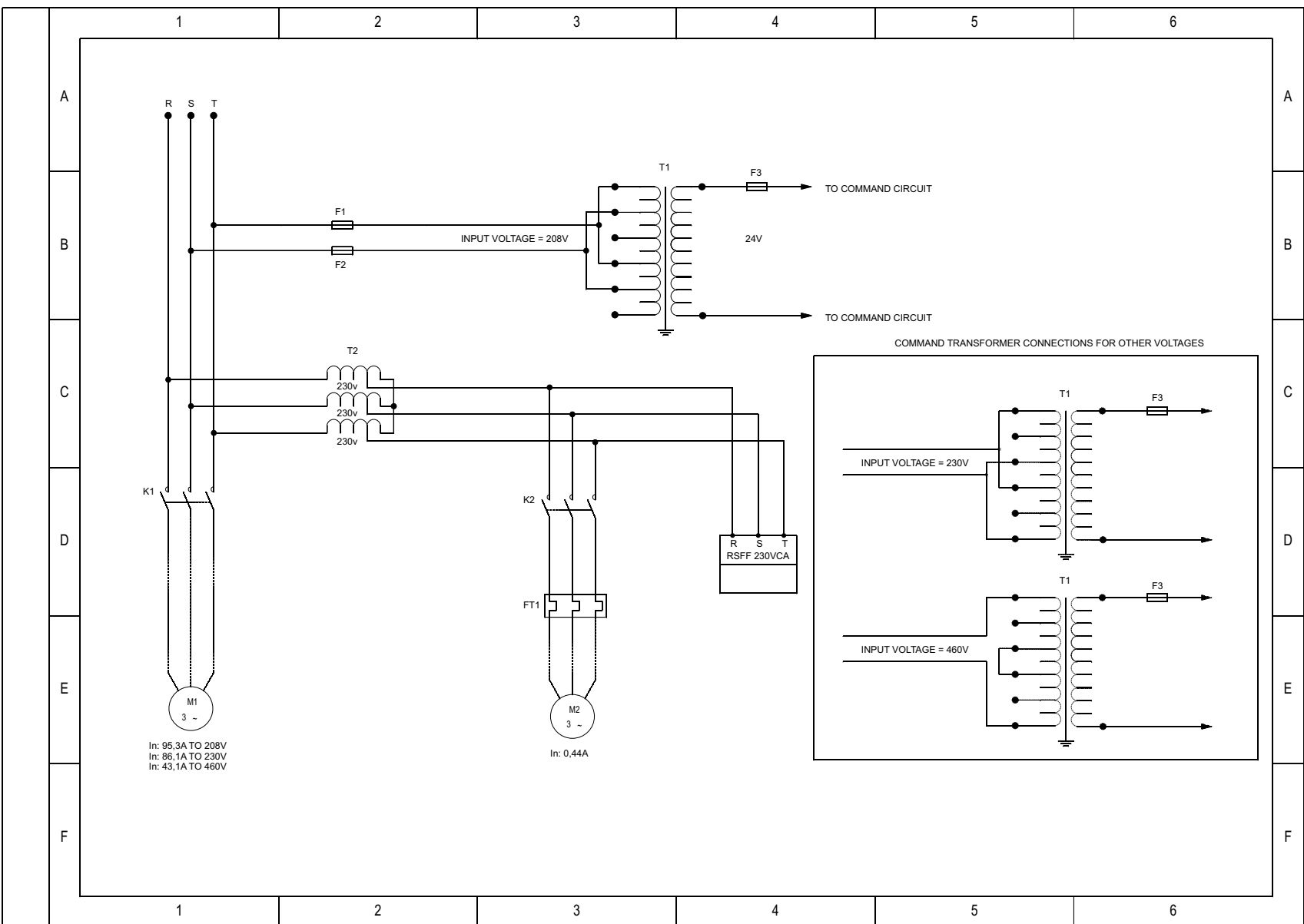


COMMAND CIRCUIT
SRP 3020 - DIRECT STARTER
FIGURE 11



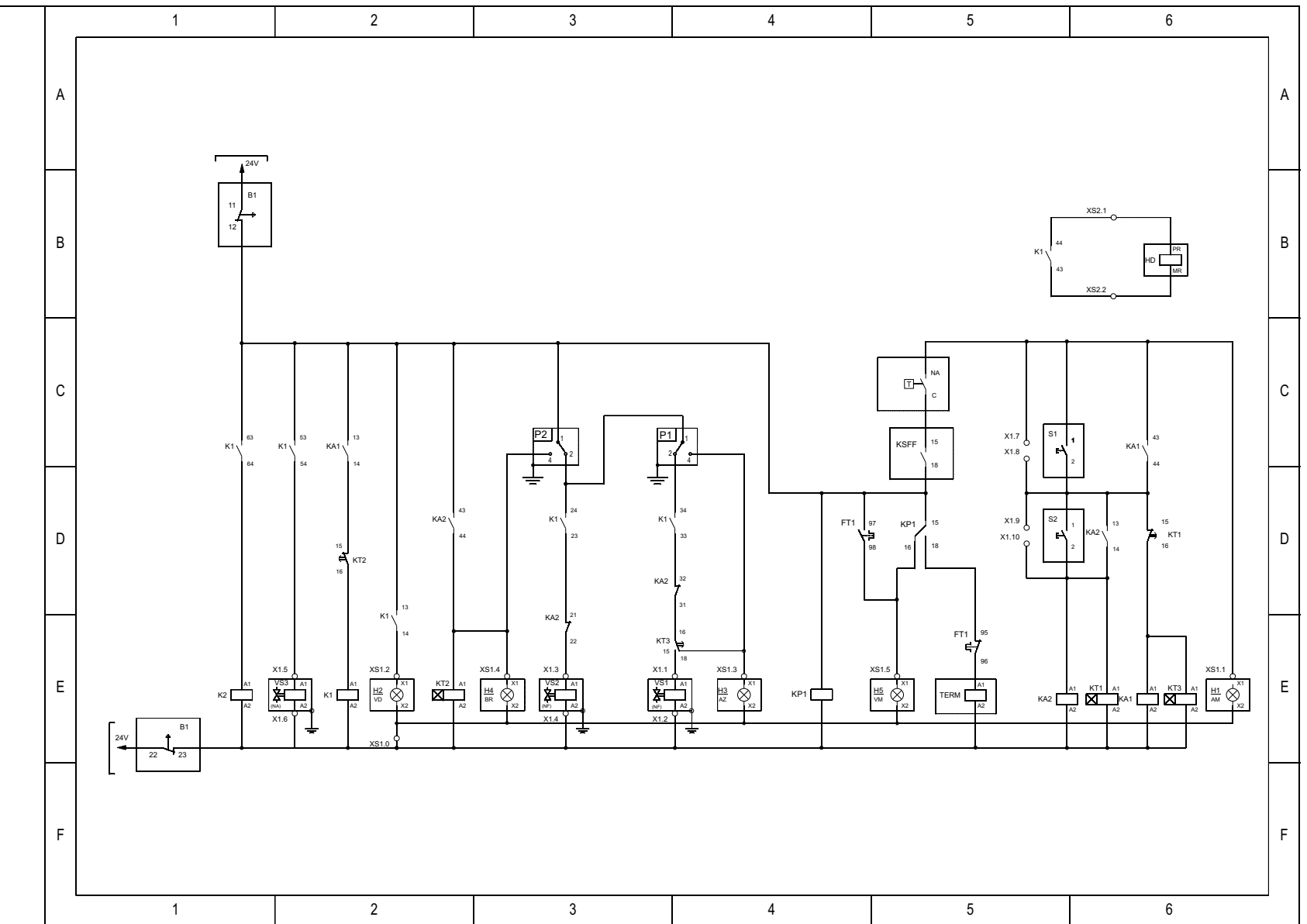
LAYOUT COMPONENTS
SRP 3020 - DIRECT STARTERS
FIGURE 12

INSTALLATION



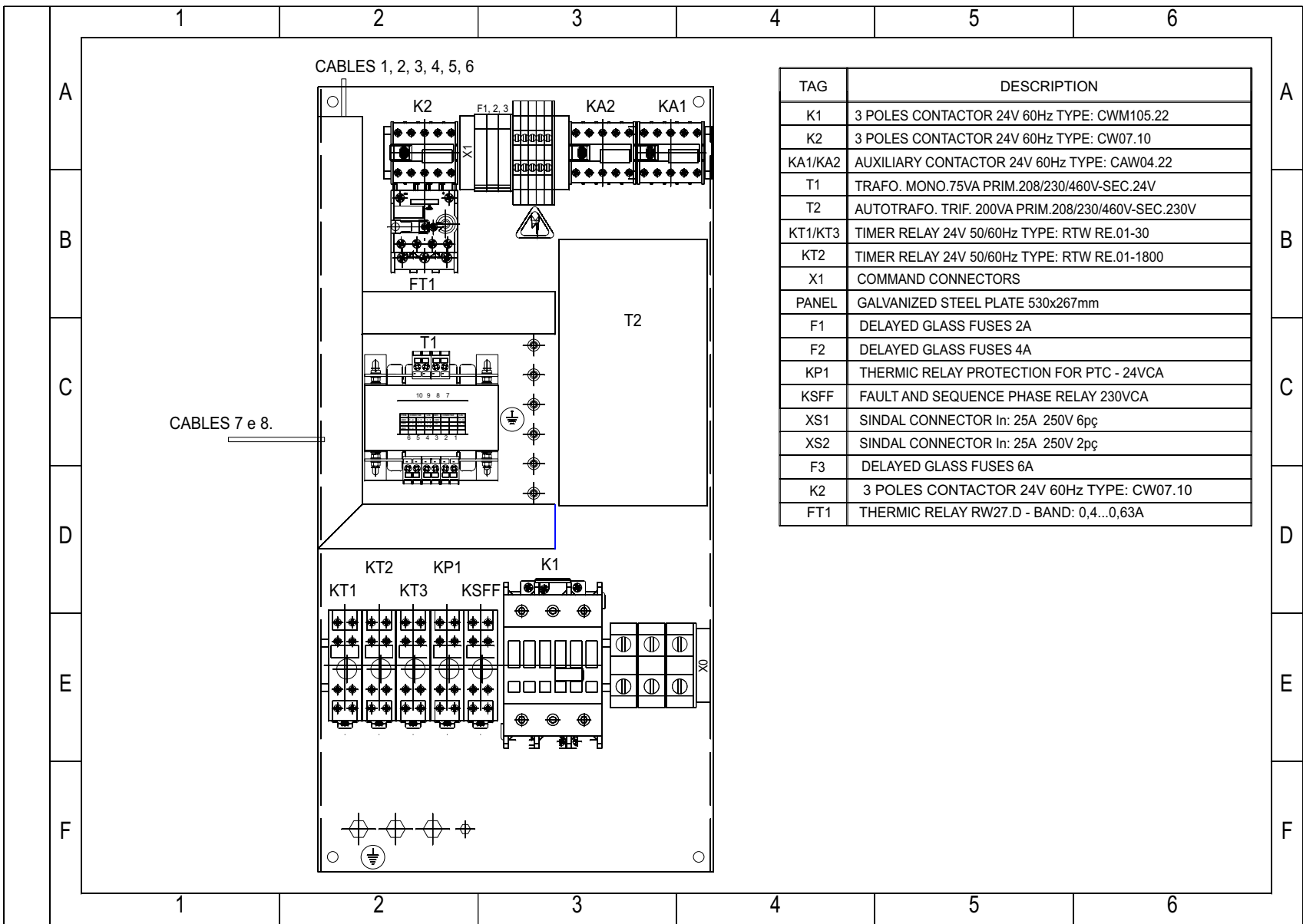
POWER CIRCUIT
SRP 3030 - DIRECT STARTER
FIGURE 13

INSTALLATION

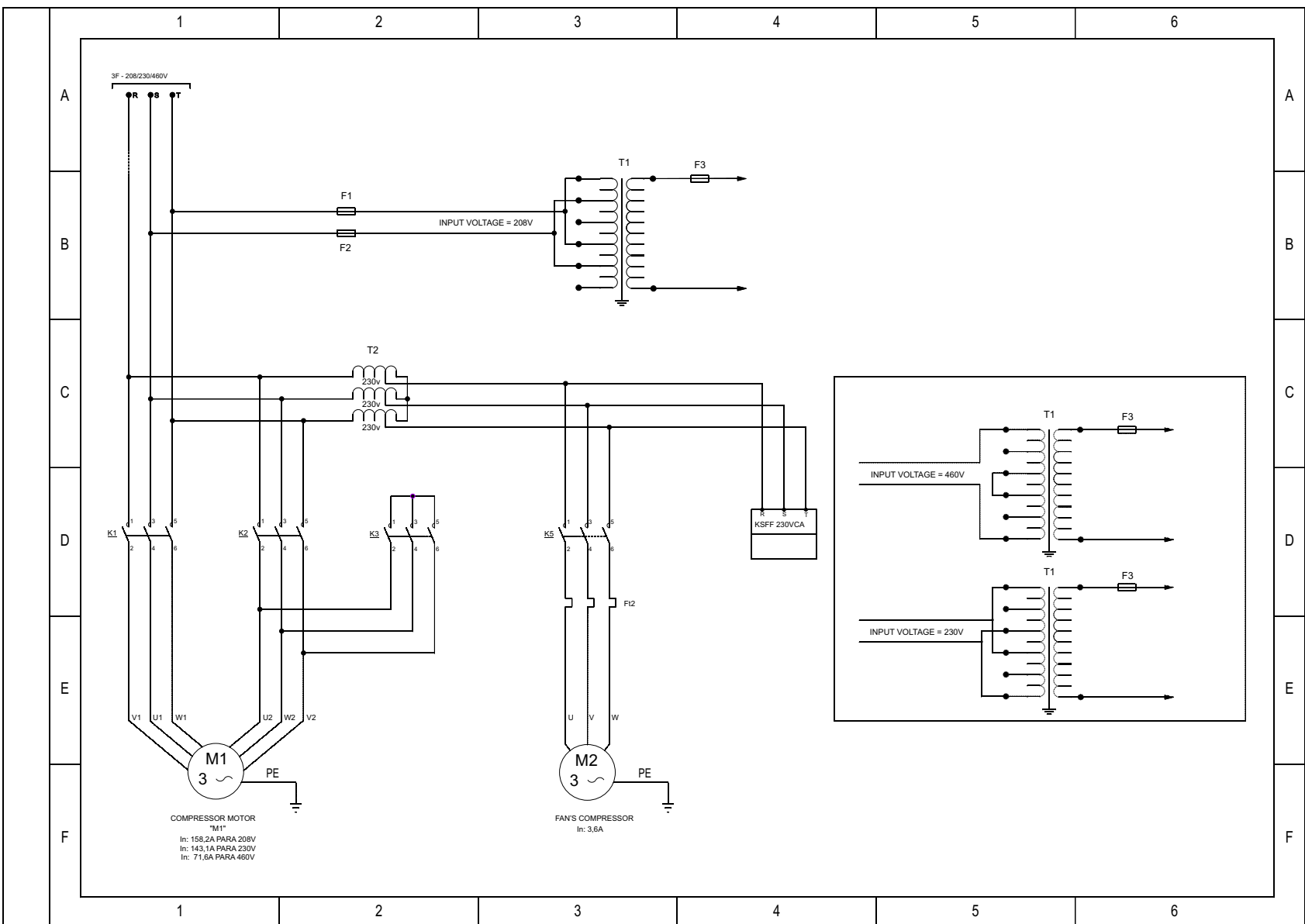


COMMAND CIRCUIT
SRP 3030 - DIRECT STARTER
FIGURE 14

INSTALLATION

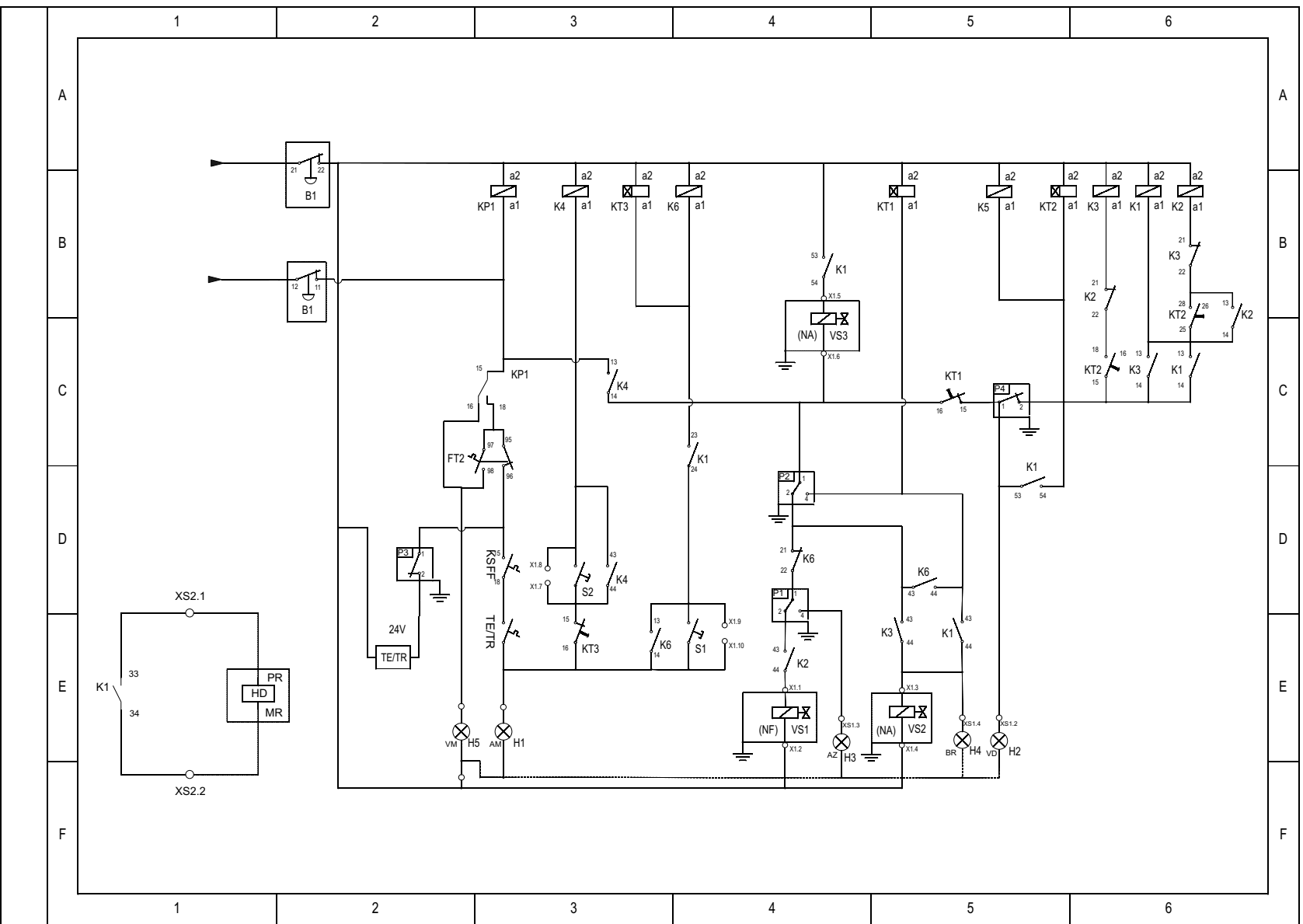


LAYOUT COMPONENTS
SRP 3030 - DIRECT STARTER
FIGURE 15

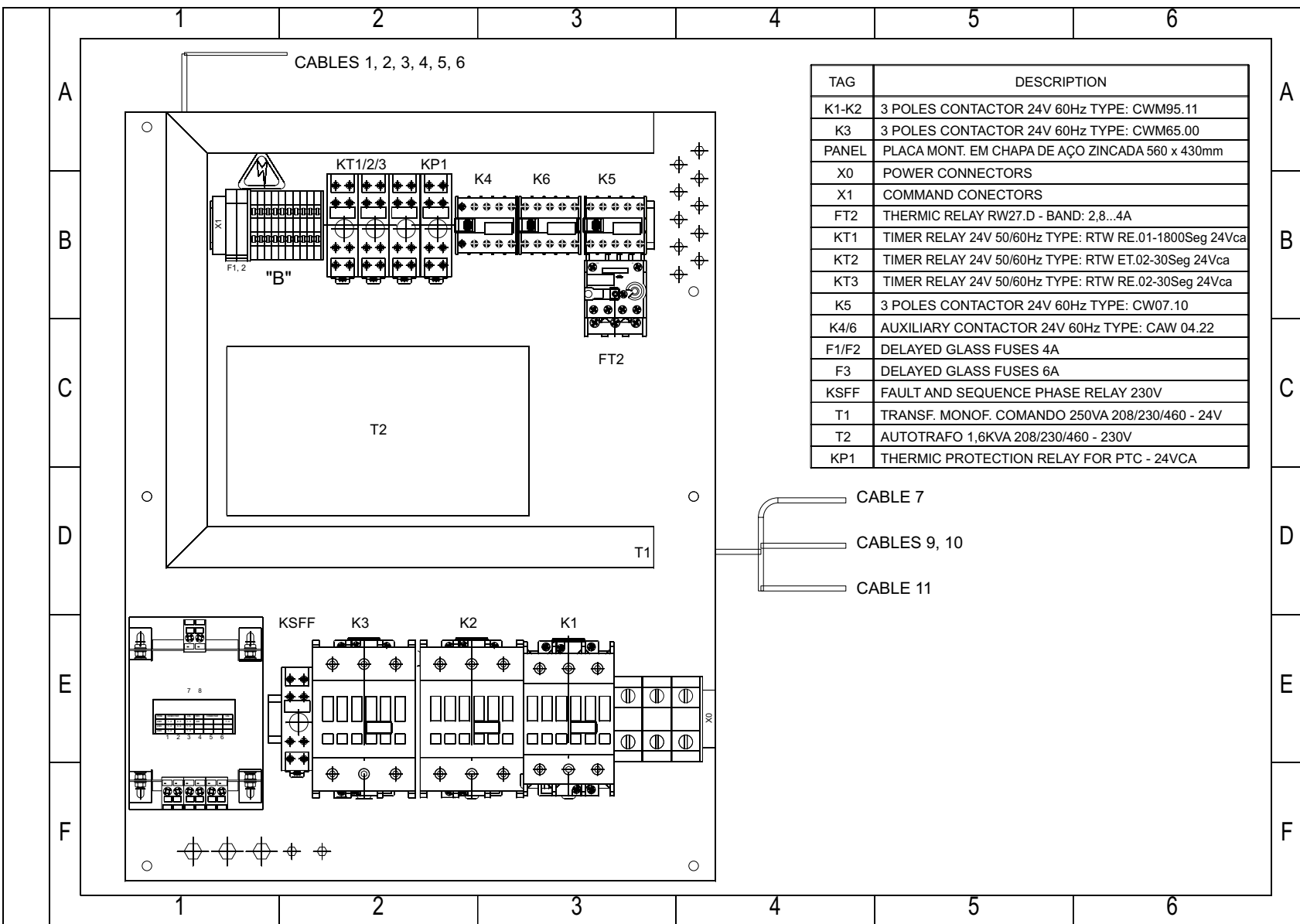


POWER CIRCUIT
 SRP 3050 - DELTA / SART STARTER
 FIGURE 16

INSTALLATION



COMMAND CIRCUIT
SRP 3050 - DELTA / STAR STARTER
FIGURE 17



LAYOUT COMPONENTS
SRP 3050 - DELTA / STAR STARTER
FIGURE 18

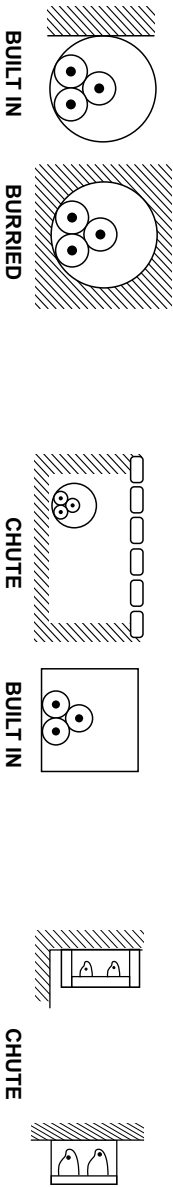
ROTARY SCREW COMPRESSOR

SRP 3015 - SRP 3020 - SRP 3030 - SRP 3050

INSTALLATION

Maximum Distances for Voltage Drop 5% (meters)																											
A	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	120	140	160	180	200	220	240
	mm ²																										
1.0	76	38																									
1.5	110	55	37																								
2.5	183	92	61	46																							
4.0	293	147	98	73	59																						
6.0	431	216	144	108	86	72	62																				
10	733	367	244	183	147	122	105	92	81	73																	
16	1122	561	374	281	224	187	160	140	125	112	102	94	86														
25	1719	859	573	430	344	286	246	215	191	172	156	143	132	123	115	107	101	95									
35	2292	1146	764	573	458	382	327	286	255	229	208	191	176	164	153	143	135	127	121	115							
50	3014	1507	1005	753	603	502	431	377	335	301	274	251	232	215	201	188	177	167	159	151	126						
70	4074	2037	1358	1019	815	679	582	509	453	407	370	340	313	291	272	255	240	226	214	204	170	146	127				
95	5238	2619	1528	1310	1048	873	748	655	582	524	476	437	403	374	349	327	308	291	276	218	187	164	146	131			
120	6286	3143	2095	1571	1257	1048	898	786	698	629	571	524	484	449	419	392	370	349	331	314	282	224	196	175	157	143	131

WAYS TO INSTALL



Distances in meters, for 220V, BWF Noflan Cable, 750V, three-fase, cosφ - 0.8.
For 380V, multiply by 1.727
For 440V, multiply by 2

		Maximum Distances for Voltage Drop 5% (meters)																										
A		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	150	200	250	300	350	400	450
mm²																												
6	411	206	137	103	82	69	59	51																				
10	661	330	220	165	132	110	94	83	73	66	60																	
16	991	495	330	248	198	165	142	124	110	99	90	83	76	71	66													
25	1447	724	482	362	289	241	207	181	161	145	132	121	111	103	96	90	85	80	76	72								
35	1864	932	621	476	373	311	266	233	207	186	169	155	143	133	124	117	110	104	98	93								
50	2316	1158	772	579	463	386	331	289	257	232	211	193	178	165	154	145	136	129	122	116	77							
70	2973	1486	991	743	595	495	425	372	330	297	270	248	229	212	198	186	175	165	156	149	99	74						
95	3548	1774	1183	887	710	591	507	444	394	355	323	296	273	253	237	222	209	197	187	177	118	89						
120	4074	2037	1358	1019	815	679	582	509	453	407	370	340	313	291	272	255	240	226	214	204	136	102	81					
150	4583	2292	1528	1146	917	764	655	573	509	458	417	382	353	327	306	286	270	255	241	229	153	115	92	76				
185	5000	2500	1667	1250	1000	833	714	625	556	500	455	417	385	357	333	313	294	278	263	250	167	125	100	83	71			
240	5641	2821	1880	1410	1128	940	806	705	627	564	513	470	434	403	376	353	332	313	297	282	188	141	113	94	81	71		
300	6286	3143	2095	1571	1257	1048	898	786	698	629	571	524	484	449	419	393	370	349	331	314	210	157	126	105	90	79	70	

Example: Motor's current 35A (220V) - 35 mm² cable section maximum distance found 266 meters.

WAYS TO INSTALL

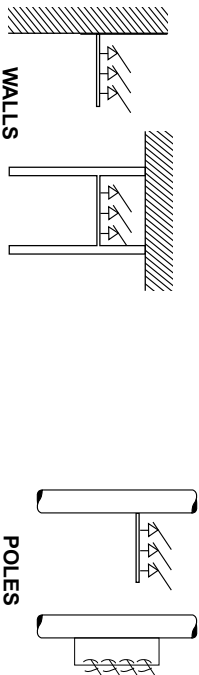


TABLE 3 - ORIENTATION TABLE FOR COPPER CABLES

INSTALLATION

INSTALLATION OF CAPACITORS

Power Factor Correction

A rational and economic way to obtain the necessary reactive energy for your compressor's proper operation is the installation of capacitors next to it.

The capacitors installation, however, must be preceded by operational measures that reduce the reactive energy necessity, as the switching off of motors or other idle inductive loads.

The advantage of the power factor correction is a meaningful voltage improvement.

CARES DURING INSTALLATION OF CAPACITORS

Installation location:

- Avoid sun exposure or installation near high temperature equipment;
- Do not block cabinets' air inlet and outlet;
- Locations must be protected against suspended solid and liquid materials (dust, oil, etc);
- Avoid capacitor installations next to the ceiling (heat);
- Avoid capacitor installations next to non linear loads.

PROTECTION AGAINST SHORT CIRCUITS

Fuses: Design fuses according to equation: $I_n \times 1.65$

NOTE: "I_n" capacitor's plate datum

Use the commercial value of immediately superior retarded type fuse.

Conductors: Use conductors over-designed in 1.43 times the capacitor's nominal current and take into consideration other criteria such as: the way to install, ambient temperature, etc.

NOTE: The installation of capacitors to correct the power factor shall be made by a certified professional.

See in the Diagrams **A** and **B** below, the proper way to connect the capacitors during the installation of your compressor.

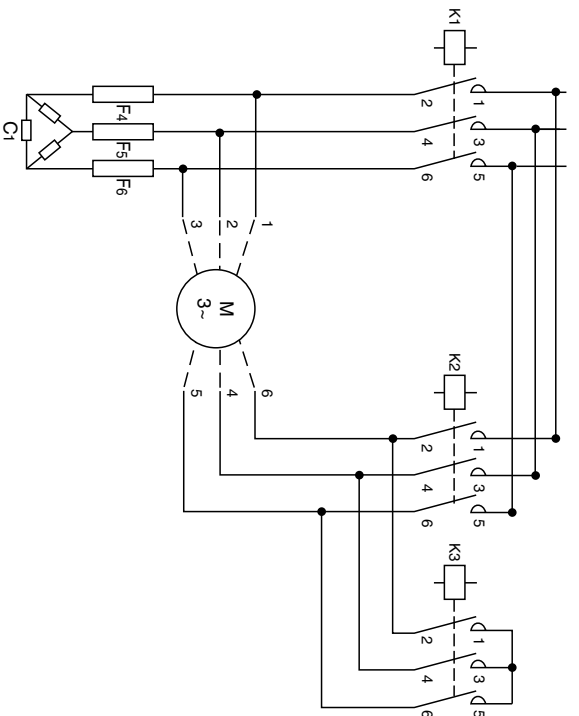


Diagram **A** - Y / Delta Start

FIGURE 19

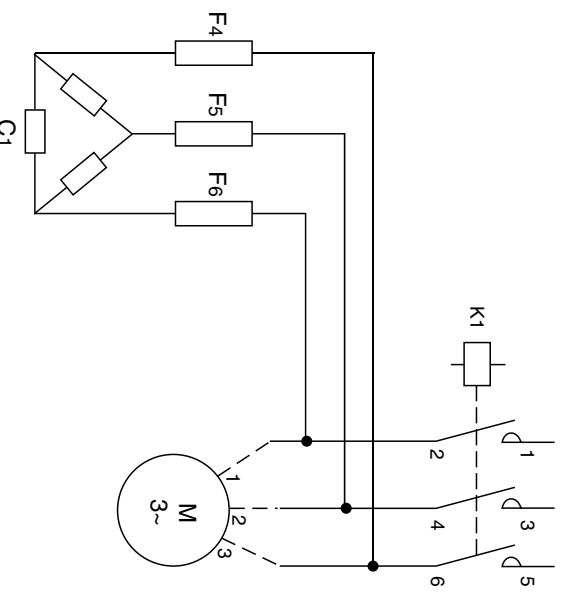


Diagram **B** - Direct Start

FIGURE 20

INSTALLATION

5. Air distribution

A ball valve is supplied with the compressor for connection to the air distribution network. To maximize air delivery to point(s) of use, air distribution piping diameter should be no smaller than the air outlet diameter.

Do not use air line filters or regulators whose ports are smaller than the air piping diameter. In smaller systems it is recommended that an air receiver (condensed separator) be installed. It should have a minimum storage capacity that is equal to or greater than 1/5" of the capacity (in gallons/liters per minutes) of the compressor.

Installing an air receiver in this manner will significantly reduce the interval of the demand fluctuations within the control system of the compressor.

If SRP 3,000 series compressors are properly sized for a facility, the installation of a receiver is not necessary. However, a good compressed air network design always includes the installation of a receiver in order to cushion control fluctuations caused by erratic air consumption, gather condensed water and to maintain an adequate air supply during consumption peaks.

We recommend that the installation, at the compressor's outlet, include an auxiliary air outlet with a hose and nozzle to clean the cooler and other tasks which may require the use of local compressed air.

For more information and guidance in the design of your air distribution system, please consult your SCHULZ Authorized - Technical/Distributor.

⚠ IMPORTANT

To maintain compressed air quality, do not locate condensed separator, filters or refrigerated dryers in vicinity of cooling air exhaust stream (See Figure 21).

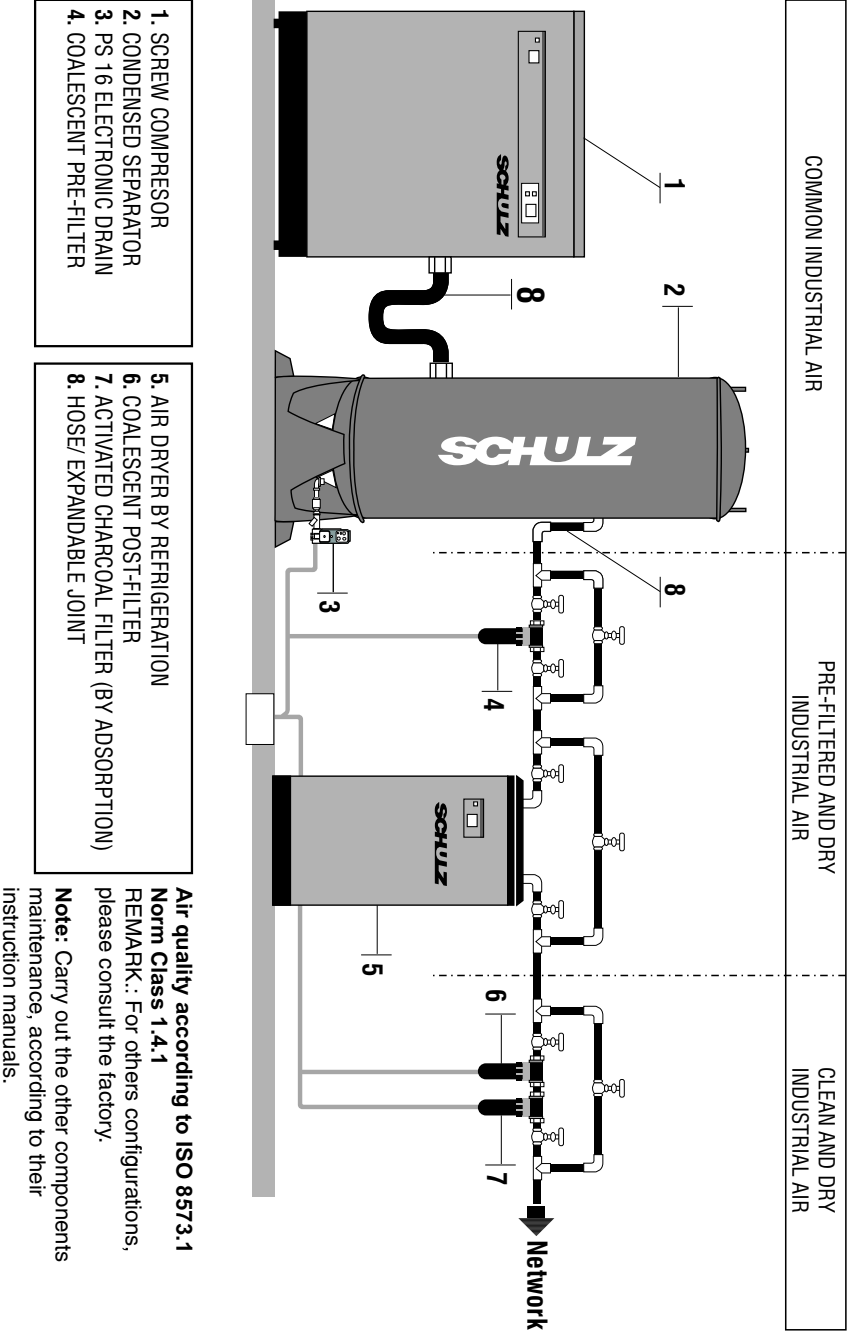


FIGURE 21 - COMPRESSOR'S TYPICAL INSTALLATION WITH ATTACHMENTS FOR COMPRESSED AIR TREATMENT.

Note: Installation expenses and accessories are the customer's responsibility.

WORKING PRINCIPLES

1. Air end

The main parts of a air end are:

Unit's body 1.

Two screw rotors, 2 and 3, operating on ball bearings on body 1, a discharge flange 4 and a ball bearing cover 6.

The driving shaft is retained by a seal 5.

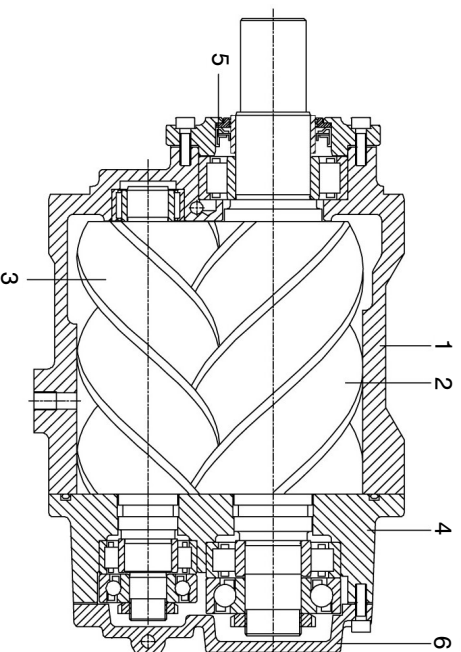


FIGURE 22 - AIR END

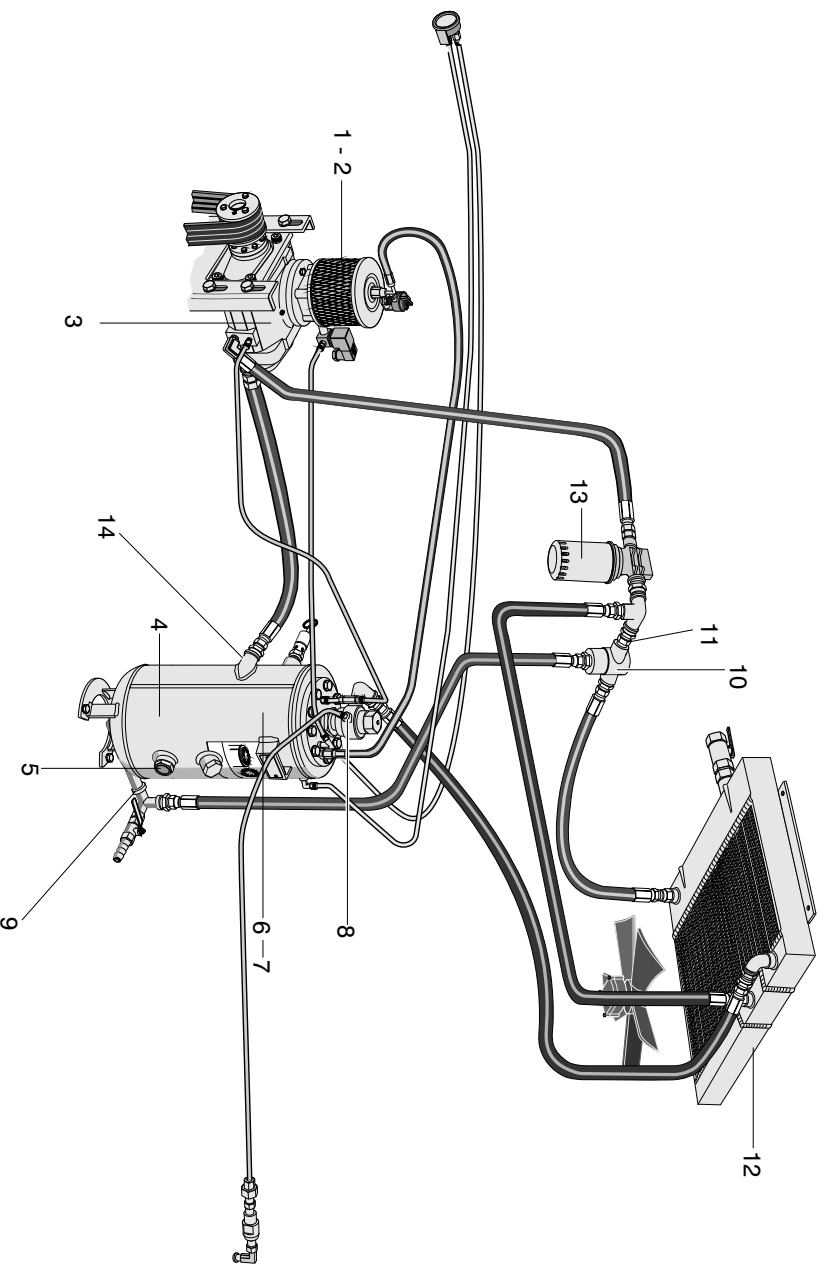


FIGURE 23 - AIR/OIL FLOW

WORKING PRINCIPLES

2. Air Flow (Figure 23, page 23)

When the motor is started, power is transmitted to the air end by pulleys and belts.

The rotation of the screws creates a vacuum and the air production cycle begins when suction occurs.

The [atmospheric] air flows through filter (item 1) and enters in the air end (item 3) [radially] through the holes located in the inlet control valve (item 2). Air compression [axial] is accomplished as air is forced between the lobes of the screws (rotors) and the air end housing. Air is then forced through the discharge port.



FIGURE 24 - AIR END WORKING

During this start sequence, the air end is lubricated by residual oil. (See oil flow description).

Air suction through the partially opened inlet control valve does not require the full power of the motor. Initial air compression at start-up (minimal pressure) and the minimum pressure valve facilitate the rapid pressurization of the air/oil receiver (item 4) causing, by positive pressure, the flow of lubricant (item 5) into the air end.

At the discharge of the unit, the compressed air, mixed with lubricant oil, is introduced tangentially and at high velocity into the receiver. Here, the centrifugal force separates the [denser] oil from the air. Due to its density, the oil settles to the bottom of the receiver.

The compressed air and residual oil then passes through the separator element (item 6). Due to the selectively restrictive nature of the filtering media the air flows freely through the element and the oil loses its velocity and falls to the bottom of the air-oil separator (item 7).

In a few seconds the internal pressure of the receiver rises to 1.7 to 3.4 bar (25 to 50 psig), the motor is operating at its' nominal rotation and the air can be introduced and compressed at full capacity with the inlet control valve (item 2) completely open. For compressors with starting method star-delta, it is at this point that the star-delta starting system introduces full voltage to the electric motor.

With the inlet control valve totally open and the air being compressed at full capacity, the pressure in the receiver rises rapidly and overcomes the spring tension which maintains closure of the minimum pressure valve (item 8) and the air passes through the after-cooler (item 12) and into the compressed air network.

The minimum pressure valve has the following functions:

- A.** Operates as a check valve, preventing network air from re-entering to the air-oil receiver of the compressor when it is off or modulated;
- B.** Maintains minimum pressure of about 3.4 bar (50 psig) to ensure adequate lubrication;
- C.** Maintains minimum pressure to prevent inappropriate oil consumption rate.

3. Oil Flow (Figure 23, page 23)

There is a residual quantity of oil present in the air end. This residual oil provides lubrication for the first few seconds. Once the compressor starts and pressure of around 2.0 bar (30 psig) is achieved in the air-oil receiver, the positive pressure (item 4) forces oil into the air end thereby insuring lubrication.

During the first few minutes of operation the oil will not be heated to its ideal working temperature (80 to 90°C or 176 to 194°F). In order to rapidly achieve the desired temperature, the oil circuit has a thermostatic valve (item 10) with two circulation routes.

Below 80°C or 176°F, the oil flows into the compressing unit through an oil by-pass (item 11). The thermostatic valve (item 10) prevents oil flow through the oil cooler.

The oil warms up quickly from the heat of compression and very quickly reaches the ideal operating temperature.

WORKING PRINCIPLES

At 80°C or 176°F the thermal element expands, displacing the piston inside the valve that progressively closes the oil by-pass (item **11**) and allows oil flow through the oil cooler (item **12**).

In addition to rapid warming of the oil the thermostatic valve prevents oil cooling to temperatures below 80°C or 176°F. By regulating oil flow through the cooler and the by-pass, the valve ensures that all the oil injected into the air end is at the ideal working temperature. This reduces the condensation of water vapor in the separator and receiver which maintains the quality of the oil and reduces air system contamination.

The oil from the two circulation routes (cooler and by-pass) mixes and is filtered (item **13**) before being injected into the compressing unit.

The oil deposited at the bottom of the separator element is continuously evacuated back to the inlet side of the air end.

INSTRUMENT PANEL

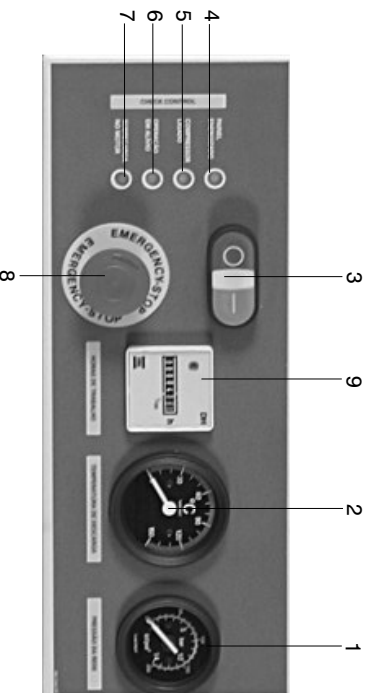


FIGURE 25 - INSTRUMENT PANEL - SRP 3015

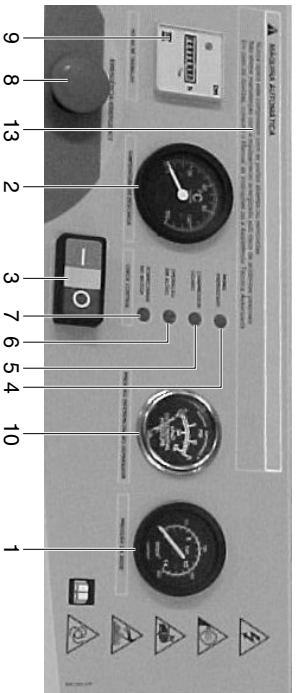


FIGURE 26 - INSTRUMENT PANEL - SRP 3020 AND SRP 3030

1. Pressure gauge - to show pressure in the network
2. Thermometer discharge temperature
3. ON button (**green**), OFF button (**red**)
4. Indicator light - to indicate if the compressor is energized
5. Indicator light - to indicate if the compressor is in operation
6. Indicator light - to indicate if the compressor is unloaded

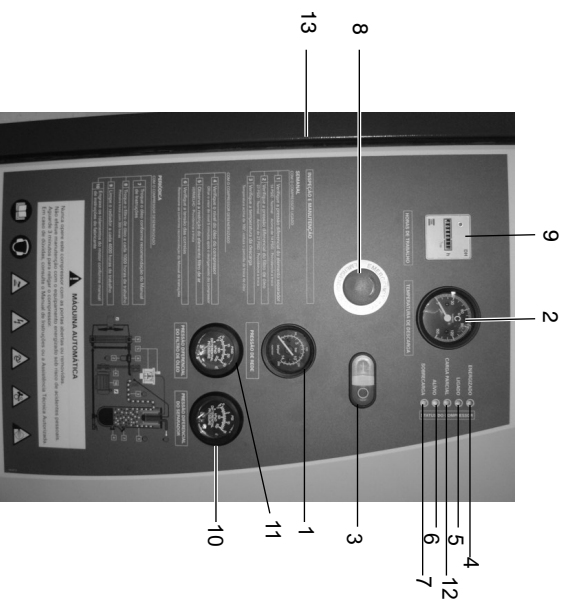
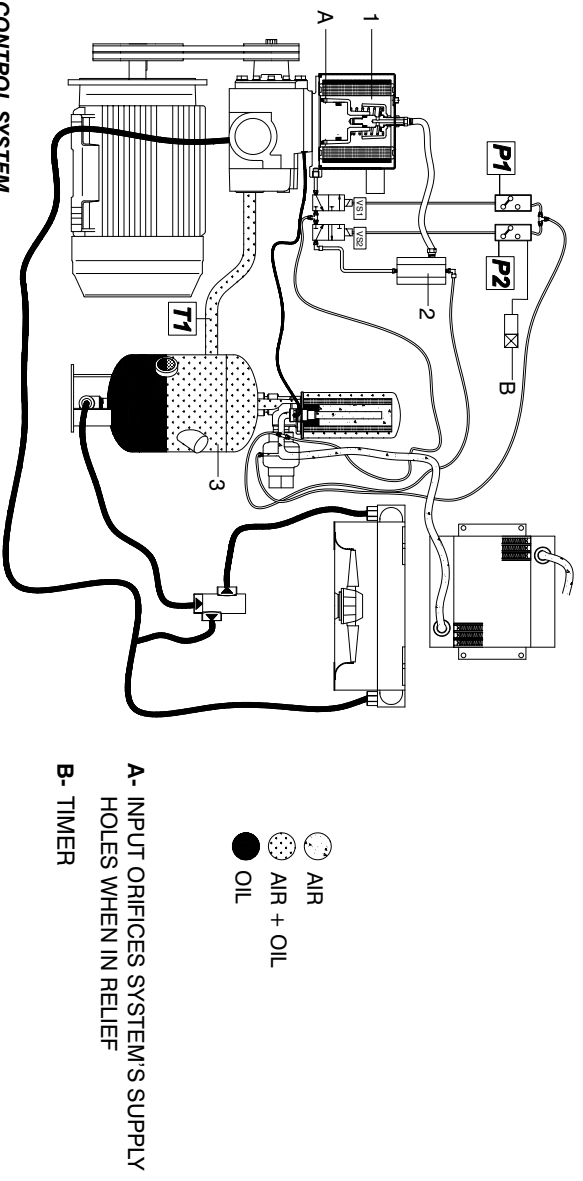


FIGURE 27 - INSTRUMENT PANEL - SRP 3050

7. Indicator light - to indicate overload electric motor
8. Emergency shut off button
9. Hourmeter
10. Separator differential pressure gauge
11. Oil filter differential pressure gauge
12. Indicator light to indicate if the compressor is in partial load
13. Quick instructions

CONTROL SYSTEM

FIGURE 28 - CONTROL SYSTEM

The compressor operates with a double control as follows:

COMPRESSOR CONTROL AT FULL LOAD

1. When the pressure rises attaining the adjusted value in the pressure switch **P1**, it de-energizes the solenoid valve of the by-pass **VS1** closing the control way which maintained the intake valve **1** totally open.

COMPRESSOR CONTROL AT THE PARTIAL LOAD

1. In this control phase, the intake valve will be closed, stopping the full flow of air in the suction, but the air continues to be taken in by the holes "A" called by-pass. As the passage section of these holes is small, it reduces the volume of air taken in, and consequently the power due to reduction of the flow of mass to be compressed. The compressor starts to deliver to the air network approximately 50% of its total suction capacity.
2. With the reduction of the air taken in, the power of the motor required to maintain the system is also reduced, and so it is possible to increase the final work pressure in this control phase.
3. The exit of the compressor from this control system, and the return to operation at full load, only occurs if the consumption is greater than the production of the compressor (50% of the total), because it causes the pressure in the system to drop and the return of the compressor to its previous working status, i.e. at full load.
4. Operating at full load, if the air consumption is lower than the production of the compressor, the pressure will slowly rise (**above the pressure indicated in barg/psig in Table 1 Technical Data, page 3**) and then the compressor will start to operate in the partial load system. If there is no air consumption, it will operate in the unloaded system.

COMPRESSOR CONTROL UNLOADED

1. Even taking in air via the by-pass the pressure in the system may increase up to the adjusted value in the pressure switch **P2**, where it will de-energize the solenoid valve **VS2** closing it, which in turn will drain the air which maintained the relief valve **2** closed, allowing the release of compressed air.
2. With the relief valve open, it will start the depressurization of the receiver **3** up to the volume taken in by the by-pass holes entering into balance with the volume of air drained by the relief valve, equaling the pressure in the receiver between 2.1 and 4.1 barg (30 and 60 psig) necessary to ensure lubrication in the system, reducing the power required.
3. In this control phase the compressor will not produce air for the network. If there is consumption at this moment, the pressure may be reduced in the system, causing the solenoid valve **VS2** is energized by the pressure switch **P2** and returning the compressor to partial load.
4. If there is a pressure drop because of an increase in consumption, the solenoid valve of the by-pass **VS1** will be energized by the pressure switch **P1**, returning the compressor to full load.

CONTROL MODE

The compressor runs at full load and it starts to unload as soon as the maximum work pressure is reached.

The time it remains unloaded is adjusted through "KT1" minute timer, located in the electric panel, according to the air network's behavior.

The motor can have up to **10** starts per hour, but it is not economically viable.

We recommend that the timer's minimum adjusting time should be of 6 minutes.

If during this time there is no consumption that causes pressure to drop from 1.03 to 1.4 bar (15 to 20 psig), the compressor will switch off. It will return as soon as this pressure drop occurs. If the above mentioned pressure drop occurs, the compressor starts operating at full load. The "KT1" minute timer's adjustment is at the customer's choice, depending on the air network behavior.

When the off button **3* (red)** is pressed, the compressor starts to unload, after the time adjusted in "KT3" timer. The motor's switching off will occur right after.

For safety reasons, your compressor is supplied with emergency button **8*** that, when pressed, will switch off the equipment immediately. To re-start the compressor, turn the button (see orientation arrow on it) to release it and, right after, press the on button **3* (green)**.

* See Figures 25 to 27, page 25.

TECHNICAL DELIVERY

After all the compressor is installed and connected as per the customers requirements, the compressor must be started in the presence of a representative of the nearest SCHULZ Authorized-Technical/Distributor. This technician will validate the Warranty as required by SCHULZ and will guide the customer on starting procedures, and provide owner/operator training in the compressor's operation and preventive maintenance. The compressor's warranty will be validated and the warranty period initiated only a) upon production of the Technical Delivery report provided by SCHULZ Authorized-Technical/Distributor during the first start procedure - one copy of which will remain with the customer and b) the filling in of the Technical Delivery Log (page 41) which will be sent to the factory by the technician. Instructions contained in item "A" of the Warranty Terms (page 43), under General Warranty Conditions, must be followed.

START PROCEDURE

SRP 3,000 series compressors are tested in the factory and supplied with **SCHULZ LUBE SH 46**.

Before the compressor's initial start, check the belt's strain (Figure 30, page 29), re-fasten the connections of the hydraulic circuit hoses and of the electric contacts, then, turn on the air dryer 5 minutes before starting the compressor (when installed).

First start procedure:

- A.** Open the cabinet's left side door (facing the panel) and check the oil level; the oil level sight (item **21**, pages 5 and 6) must be covered;
- B.** If the ambient temperature is different from specifications, change to screw compressor lubricant oil consult your SCHULZ Authorized-Technical/Distributor.

C. Indicator light (item **4**, page 25) of the instrument panel must be on showing that the controls are energized;

D. Close the air outlet valve;

E. Check Rotation by quickly pressing the Start Key (**green**) to switch on the compressor and immediately pressing the emergency stop (**red**) button, switching the compressor off and observing the direction of rotation. It must be in the direction indicated by the arrow located in the air end casting or the belt guard. The rotation of the cooling fan must be checked as well. The correct air flow is toward the cooler.

Notes: If the rotation is incorrect, disconnect input power from the compressor and interchange two of three main cables on terminal board installed in the control box. Repeat procedure **E**.

F. After making sure that the rotation direction is correct, close the side door and press the Start Key (**green**) to run the compressor again, keeping the valve closed until the compressor reaches its maximum pressure and starts to unload. Slowly open the valve and your rotary screw air compressor is now ready to supply compressed air to the network.

Note: The air dryer should already be turned on.

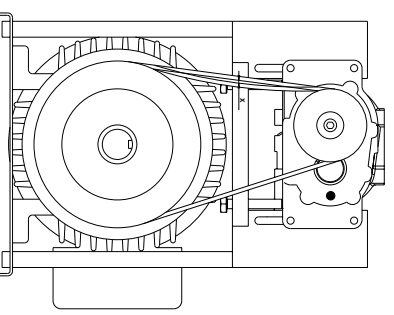


FIGURE 29

START PROCEDURE

⚠ IMPORTANT

- 1- The compressor should never run with its doors open for more than three (3) minutes.
- 2- In the first start, the motor must not work for more than three seconds (3) with the inverted rotation. Item “E” is accomplished quickly and will be easily observed. In case of problems during the start-up, consult the Troubleshooting Tips Chapter, page 35.
- 3- In emergencies, press the emergency button 8 (page 25) that will switch off the compressor.
- 4- The emergency button must only be used when the compressor needs to be stopped immediately. Its use under normal conditions will cause failure in the equipment. This is not covered by the warranty.
- 5- In normal operations, use the Stop Key (red) on the instrument panel, where a timed unload will occur before the compressor stops.
- 6- Under no circumstances allow the compressor to function without the short circuit protection.

STOP PROCEDURE

- A. Close the air outlet valve;
- B. To switch off (manual stop), press the stop key/button (**red**) located in the instrument panel, when the timed unload will occur before the compressor's full stop.

PREVENTIVE MAINTENANCE

1. DAILY

- 1.1 Check oil leaks.
- 1.2 Check unusual noise or vibration.
- 1.3 Monitor gage and indicators for normal operation.
- 1.4 For receiver mounted compressor, check the functioning of the electronic drain. If it does not work, use the stopcock located in the lower part of the air receiver.

2. WEEKLY

2.1 WITH THE COMPRESSOR TURNED OFF:

2.1.1 Verify the oil level:

- 2.1.1.1 Wait for at least 5 minutes after turning off the compressor so that the oil which there is in the circuit returns to the receiver

2.1.1.2 If the oil level sight is completely or partially filled up, the level is suitable. Otherwise, proceed as follows:

- 2.1.1.2.1 Ensure that there is no pressure in the air/oil receiver, slowly opening the filling plug **20**, pages 5 and 6;
- 2.1.1.2.2 Top up the level, filling all the oil level sight.

Note: do not exceed this limit, or oil may be taken into the network;

- 2.1.1.2.3 Install and tighten the plug. It is not necessary to tighten it a lot, as the plug is self-sealing.

⚠ IMPORTANT

- If working temperature is consistently over 194°F (90°C), reduce oil change interval to 50% of the recommended.

2.1.2 Verify the tension of the belts and, if required, adjust them according to the instructions:

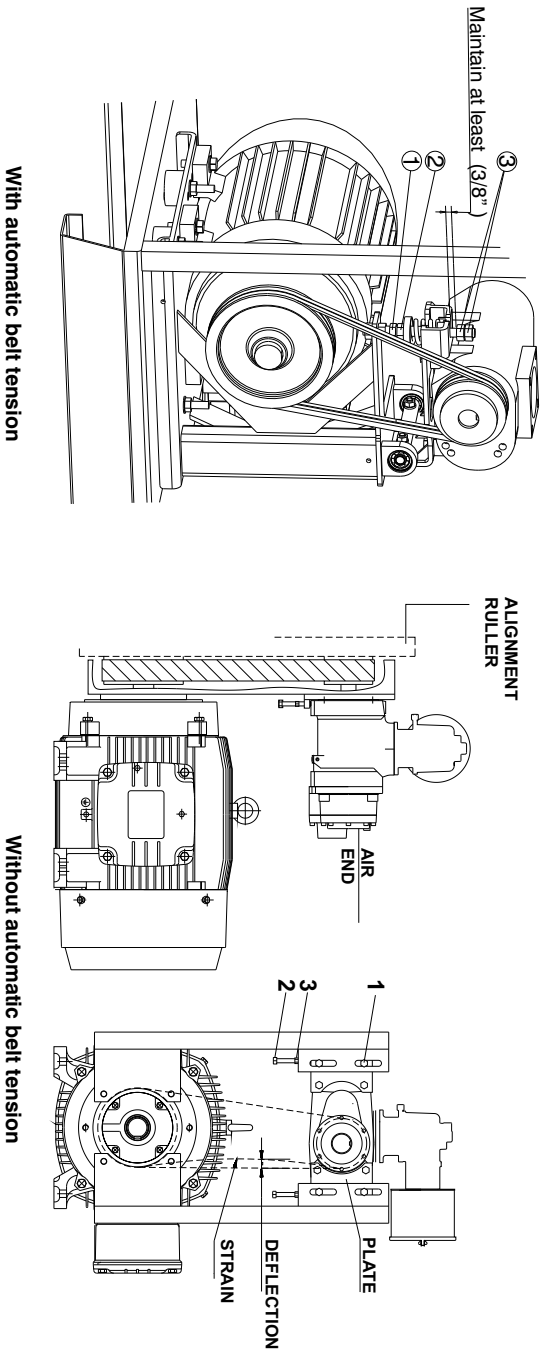
A) For compressor with automatic belt tension device (Figure 30, page 29):

- Remove the belt guard;
- Loosen the lock-nut 1;
- Turn the adjustment nut 2 to increase or reduce the tension of the belts according to the table of the Figure 30, page 29;
- Lock the position of the nut 2 tightening the lock-nut 1. This procedure should be executed with the aid of 2 (two) wrenches;
- Assemble the belt guard.

PREVENTIVE MAINTENANCE

B) For compressor without automatic belt tension device:

- Loosen screws ① (4 pieces).
- Loosen the lock-nut ②.
- Tighten screw ③ to stretch the belt.
- Partially tighten screws ① until they touch the plate and check belt s tension according to table below.
- If belt s tension is right, tighten screws ① and the lock-nut ②; if not, repeat procedures above.



MODELS	TENSION				X (cm)
	N (Newton)		lbf		
	Min.	Máx.	Min.	Máx.	
SRP 3015	29.4	44.2	6.6	10	0.5
SRP 3020	34.3	49.0	7.7	11	0.6
SRP 3030	34.3	49.0	7.7	11	0.6
SRP 3050	190	245	4.3	55	1.0

FIGURE 30 - BELTS TENSION

2.1.2.1 In the order to measure the force, use a tensiometer-code 021.0097-0, which should be acquired from the nearest Schulz Authorized-Technical/Distributor.

2.1.2.2 Use an appropriat level ruller to align the pulleys. If the alignments is incorrect, get in touch with Schulz Autorized-Technica/Distributor.

PREVENTIVE MAINTENANCE

⚠ IMPORTANT

- When the tension of the belts(s) is incorrect, they will overheat and slip. A squealing sound may be noticed.
- Another way to check the belt tension is to monitor the air end's rpm and observing its variation.
- The belts must be replaced when they show signs of wear or when there is difference in belt tension (see table Figure 30, page 29).
- **Do not remove the safety nut and lock-nut 3.**

2.1.3. Check the air filter restriction: If indicator (item 2, Figure 33, page 31) is red, or if it has been used for 1,000 hours (whichever occurs first) change air inlet filter (item 1, Figure 33, page 31) and unlock the differential pressure indicator (unlocking instructions are given on its body).

2.1.4. Drain the condensed (water) from the air/oil receiver weekly, or daily, according to the ambient relative humidity, as follows:

- Switch off the compressor and wait for one hour until the condensed water is deposited on the receiver's bottom;
- Connect a hose to the drain valve (item 4, Figures 31 and 32), open it and collect the condensed water in a container;
- Close the valve as soon as the oil starts to flow from the receiver.

2.2 WITH THE COMPRESSOR ON:

2.2.1 Check operating temperature. It should be between 80 and 90°C or 176 and 194°F.

Note:

- Above 105°C or 221°F, the thermostat will shut off the compressor due to the overheating.
- If working temperature is consistently over 194°F (90°C), reduce oil change interval to 50% of the recommended.

2.2.2 Check the differential pressure of the air/oil separator element. When the differential pressure gauge (item 1, Figures 25 to 27, page 25) reaches 14 psig, change separator element (item 1, Figures 31 and 32).

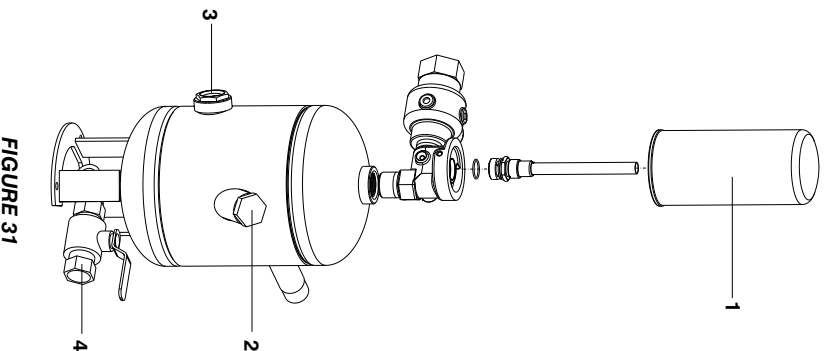


FIGURE 31

- 1. Air/oil separator element
- 2. Oil fill in plug
- 3. Oil level sight
- 4. Oil drain valve
- 5. Bolt

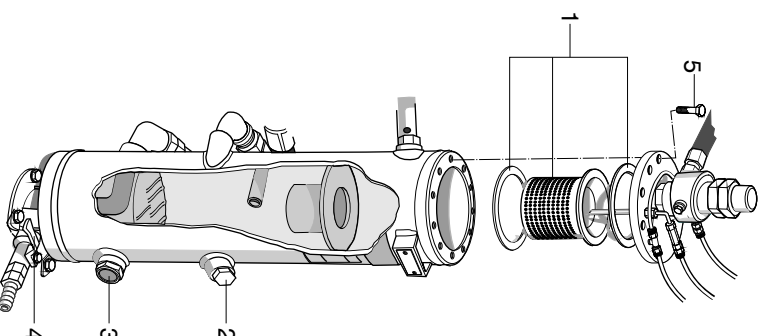


FIGURE 32

PREVENTIVE MAINTENANCE

3. EVERY 1,000 HOURS

3.1 OIL AND OIL FILTER

- If the compressor uses mineral oil, change the compressor oil and oil filter every 1,000 hours.
- If the compressor uses synthetic or non-toxic synthetic oil change the compressor oil every 8,000 hours. The oil filter change must occur at every 2,000 hours.

⚠ IMPORTANT

- If working temperature is consistently over 194°F (90°C), reduce oil change interval to 50% of the recommended.
- The first oil filter change must be carried out with 300 operating hours.
- See Table 5, item 8, page 34, compressor operational condition.
- Changing oil types is not highly recommended, as chemical incompatibilities can cause damage to the machine.
- We recommend the **SCHULZ LUBE SH 46** oil. Consult your SCHULZ Authorized-Technical/Distributor for additional information.

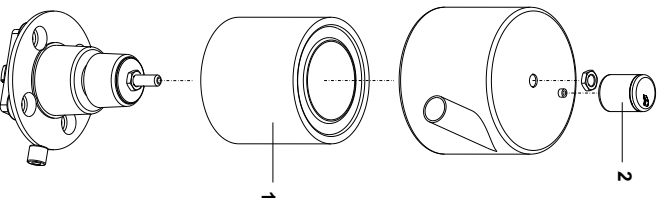


FIGURE 33

3.2 OIL CHANGE PROCEDURES

- 3.2.1. Turn off the compressor and wait for three minutes until the system pressure is depleted.
- 3.2.2. Attach a hose to oil drain valve (item 4, Figure 32, page 30), open it and collect the used oil in an approved container. Close the valve when draining is completed.
- 3.2.3. Open plug and fill compressor with lubricant.
- 3.2.4. Close the plug as soon as filling is completed.
- 3.2.5. Turn on the compressor and let it run for about 5 minutes.

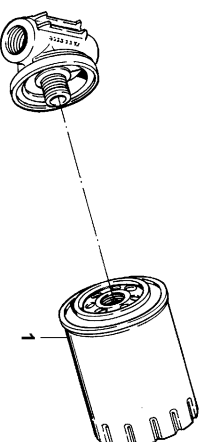


FIGURE 34 - OIL FILTER

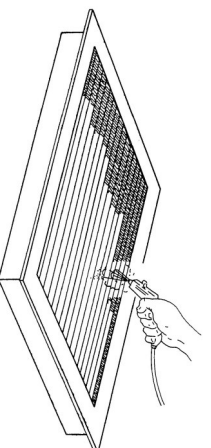


FIGURE 35

3.3 RE-FASTENING OF THE ELECTRICAL CONNECTIONS

Check the tightness of all electrical connections in the cabinet. Tighten as necessary.

3.4 AIR FILTER ELEMENT (item 1, Figure 33)

Change the air filter element.

PREVENTIVE MAINTENANCE

4. QUARTERLY

Clean the cooler using compressed air (Figure 35, page 31): It must be blown against the fan's flow.



Note: Whenever there is high incidence of material deposited inside the compressor or on the cooler's fins, increase the frequency of this cleaning.

5. EVERY 3,000 HOURS

Change the air/oil separator element (item 1, Figures 31 and 32, page 30). See table 5 page 33 about how increase the changing interval.

5.1. INSTALLATION OF THE AIR/OIL SEPARATING ELEMENT (item 1, Figures 31 and 32, page 30):

5.1.1 At the moment of installing the separating element apply a small film of oil to the sealing of the element;

5.1.2 For external element, assemble the element on the adaptor and turn it until there is a slight tightening. Then give a half-turn to tighten it a little more.

Note: Do not tighten the element too much, as it will make it difficult to be disassembled.

5.1.3 For internal element, change the air/oil separator element* (item 1, Figure 32, page 30) as following:



Dispose of the used separator element according to current local norms. Allow the compressor to cool down before starting the maintenance job.

Removal

1- Remove the hose connected to the minimum pressure valve 1, and take off the oil return pipe 7 unscrewing the connector, Figure 36.

2- Remove the screws 2 that fasten the cover, but keep one of them fastened.

3- Turn the cover as shown by Figure 37.

4- Remove the separator element 6 located inside the receiver, Figure 38, page 33.

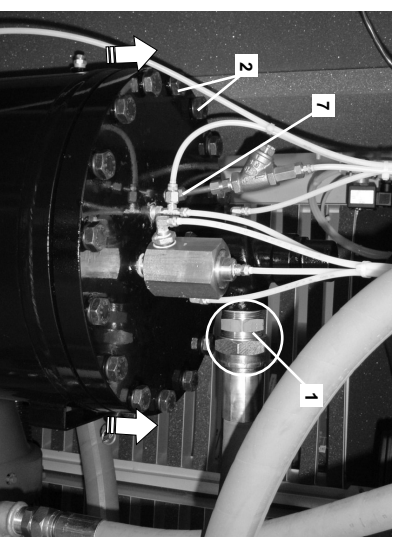


FIGURE 36



FIGURE 37

Installation

1- Clean the insulation surfaces of the receiver and of the cover and replace the gaskets.

2- Clean the receiver, if necessary.

3- Install the new separator element 6, making sure it is well coupled. **Warning:** Take care for do not contaminate the element. Handle the element only metallic parts (top or bottom).

4- Assemble the receiver's cover taking care for that the upper gasket is properly coupled.

5- Alternately in diagonal, tighten the bolts 2 to level strain using and calibrated torquimeter, like recommendation on the adhesive located on receiver.

6- Reconnect the hose and install the oil return pipe.



FIGURE 38

* It's important to check the sealing gasket of the separator element for a grounding clip (staple) or clamp. If there is no grounding clip the element must be exchanged for an element that has a grounding clip installed.

PREVENTIVE MAINTENANCE

▲ IMPORTANT

When installing this element, electrical continuity must be established and maintained between the element itself and the separator receiver. Failure to maintain continuity can result in the build-up of static electricity in the compressor. The spark resulting from the discharge of this static electricity can ignite the air/oil mixture within the compressor resulting in severe damage to equipment and injury or loss of life!

6. ANNUALLY

If required by state or local codes, a technically certified organization must calibrate the safety valve, pressure switch and the pressure gauge(s). If this is not possible, replacement of certified items with new (recently certified) items is an alternative.

7. AIR END

Experience has shown that it is extremely difficult to estimate the life expectancy of an air end.

Routine maintenance of the compressor has been proven to maintain the life expectancy of the roller bearings.

Any noticeable change in the air end's noise level should be carefully investigated as it may indicate the need for maintenance.

If preventive maintenance procedures are closely followed, bearings will have a life expectancy of 20,000 hours.

It is strongly recommended that roller bearings be changed, before they are damaged, because the failure can compromise the rotors and the case.

8. SERVICE LOG

Any maintenance to your equipment always fill in the Service Log on page 39.

Notes:

Do not clean and reuse filter elements if the number of accumulated operating hours exceeds the prescribed maintenance interval (as indicated in this Manual.)

Routine maintenance can be performed by the end user, but any additional maintenance should be carried out by a representative of the nearest SCHULZ Authorized-Technical/Distributor.

Operating conditions and demands on the machine may dictate a modification of the maintenance interval(s).

Maintenance intervals must be reduced to 50% in high demand situations or contaminated environments.

Consult with your SCHULZ Authorized-Technical/Distributor for additional information as failure to follow these recommendations may cause damage to the compressor and void the Warranty.

PREVENTIVE MAINTENANCE

PROCEDURE	DAILY	WEEKLY	EVERY 2000 h	EVERY 3000 h	EVERY 8000 h	ANNUALLY	WHEN REQUIRED
CHECK FAILURE INDICATING LIGHTS	•						
CHECK OIL LEVEL		• (1)			• (8)		
OIL CHANGE			•				
REPLACE OIL FILTER ELEMENT							
REPLACE AIR/OIL SEPARATOR ELEMENT				• (7)			
CHECK SEPARATOR ELEMENT RESTRICTION		• (3)					
CHECK OIL FILTER RESTRICTION		• (4)					
REPLACE AIR FILTER				•			
AIR FILTER RESTRICTION LEVEL		• (6)					
CLEAN COOLER EXTERNALLY							• (5)
CHECK OIL LEAKAGE			•			•	
CHECK SAFETY VALVE						•	
CHECK HOSES' CONDITION				•			
FASTEN CONNECTIONS AND SCREWS							• (5)
CHECK AND FASTEN THE ELECTRIC SWITCH CONNECTIONS			•				
CLEAN COMPRESSOR			•				
CHECK BELT TENSION AND CONDITION							
CHECK MOTORS BEARINGS (ACCORDING TO ITS INSTRUCTION MANUAL)		•					

TABLE 5
IMPORTANT

- (1) Check the oil level when the compressor is not running (wait until the air and the oil are separated and that the bubbles (foam) are eliminated, in order to get an accurate oil level checking).
- (2) The first time at 300 hours.
- (3) Separator element differential gauge.
- (4) Oil filter differential gauge.
- (5) Quarterly.
- (6) Change the filter if indicator (Figure 33, page 31) shows some restriction.
- (7) The useful life of the separator element is at least 3,000 run hours, provided that all the requirements below are satisfied:
 - installation conditions according to items 1 and 2 of the Installation chapter page 7;
 - preventive maintenance executed correctly (according to the relevant chapter);
 - machine operation system (load/relief cycle) not frequent.
 The deadline for replacing the separator element should always be evaluated by the Technical Assistance which attends to your screw compressor, (recommendations also valid for factory supply of both mineral and synthetic oil).
- (8) Operational conditions such as, ambient temperature, air/oil radiator obstruction for contamination, air renewal of the house of machine, cleanness of air, oil and separator element filters, can promote air end discharge temperature in levels that modify the useful life of the oil.
 When the air end discharge temperature be over 194°F (90°C), the period of oil change must be modified to 4000 hours.

MAINTENANCE PARTS

In order to maintain your warranty and maximize serviceability, your Schulz compressor needs routine maintenance (as outlined in the Preventive Maintenance chapter).

The following table shows the parts and code of the maintenance materials that should be purchased from your SCHULZ Authorized-Technical/Distributor.

MAINTENANCE PARTS

Denomination	SRP 3015	SRP 3020	SRP 3030	SRP 3050
Lubricant mineral/synthetic oil	-	-	-	-
Air filter	007.0184-0	007.0110-0	007.0110-0	007.0136-0
Oil filter	007.0177-0/A	007.0023-1/A	007.0023-1/A	007.0108-0
Oil filter element	-	-	-	007.0109-0
Air/oil separator element	007.0233-0	007.0119-0	007.0119-0	007.0026-6
Belt stretcher	021.0097-0	021.0097-0	021.0097-0	021.0098-0
Heavy duty filter kit	-	021.0117-0	021.0117-0	021.0118-0
Heavy duty filter	-	007.0149-0	007.0149-0	007.0154-0
Heavy duty element filter primary	-	007.0170-0	007.0170-0	007.0168-0
Heavy duty element filter secondary	-	007.0171-0	007.0171-0	007.0169-0
"VX" belt (kit) 7.5 bar	-	004.0091-0/X	004.0091-0/X	-
POLY "V" 60 Hz belt	-	-	-	004.0106-0

TABLE 6

DISPOSAL OF MAINTENANCE PARTS/MATERIALS

When the maintenance is completed, the used compressor oil, used oil filter and the used oil separator element must be disposed of in accordance with local state and federal guidelines. See instructions chapter in environmental guidance and recommendation, page 44.

OIL CONSUMPTION

Oil consumption may be increased due to any of the following conditions:

1. High temperature of operation. If temperature is consistently over 90°C or 194°F, reduce the normal oil change interval to 50% of recommended life expectancy;
2. If air/oil separator elements are clogged;
3. If there is varnish formation: it affects cooling and oil separation. Varnish formation (oil oxidation) can be seen, in metal levels, as a brown varnish/lacquer layer.

Note: We suggest not to change the oil type because there might be contamination caused by chemical incompatibility, decreasing the oil's lifetime and causing lubrication problems.

CORRECTIVE MAINTENANCE



In order to guarantee the product's SAFETY and RELIABILITY, repairs, maintenance and adjustments must be carried out with original parts by your nearest SCHULZ Authorized-Technical/Distributor.

TROUBLESHOOTING TIPS

Listed below are a number of malfunctions/difficulties that may be encountered which may cause the compressor to operate incorrectly or to stop operating completely.

Many simple procedures, designed to solve problems, are offered to the operator through the Electronic Interface display. These are valid corrective measures that can be attempted without the need for specialized technical assistance.

However, should the problem persist after having tried the established corrective actions, please contact the nearest SCHULZ Authorized-Technical/Distributor.

TROUBLESHOOTING TIPS

PROBLEM	PROBABLE CAUSE	WHAT TO DO
<p>Compressor doesn't start.</p> <p><i>Note:</i> <i>The compressor may be off due to the action of the pressure switch and it will re-start automatically.</i></p>	Lack of phase or electric power.	Check installation and protection fuses.
	Lack of command voltage.	Check command circuit fuses. <i>If there's tension in the command light (item 4), Figures 25 to 27, page 25 (if perfect) must light up.</i>
	Emergency button pressed.	Unlock the button.
	Compressing unit's overload relay is not set.	Reset and check tripping cause by re-starting compressor.
	Over temperature.	Wait until ideal operating temperature is achieved and check the cause.
	Thermostat activated.	
	Contactors' coil is burnt.	Check contactors' coils.
	Other causes: Loose or broken wires.	Check the affected components and following the wiring diagram, find the loose connection or break.
	Overload relay tripped.	Identify cause, eliminate it and check relay's setting (s).
	Discharge valve closed.	Open the valve slowly.
	Excess of water in the air receiver.	Evaluate the electronic purger, and if it is not active, request the presence of Technical Assistance.
	Wire gauge inadequate. Light (item 7, Figures 25 to 27, page 25) must light up.	Check amp draw and lag between phases. Check code and reinstall cables if necessary.
Compressor starts but turns off immediately.	Lack of phase. (fuse blown)	Check fuses and replace if necessary. Find out why fuse burned.
	Motor input cables are loose at contactors connections.	Check condition of cables and of insulations and re-fasten them if necessary.
	Defective overload relays or worn out contacts.	Check contactors' contacts. If normal, verify relay.
	Lack of oil. Temperature rises quickly.	Check oil level and fill in using SCHULZ LUBE SH 46.
	Air/oil separator element clogged.	Change air/oil separator element and the oil.
Intermittent noise at start. Contactors do not seem to activate (when green button is pressed, item 5 Figures 25 to 27, page 25 (light), switches ON and OFF repeatedly).	Voltage drop/wire gauge inadequate.	Check code and reinstall cables if necessary.
		Check for voltage drop during start-up, reevaluate cable sizing.
		Check tension lag between phases.
		Check for loose wires.
	Voltage drop of 24V in the transformer's secondary at starting up.	Check cause and eliminate it.
Electric motor rotation decrease.	24V transformer is defective.	Replace it.
	Inverted rotation.	Check rotation direction. Reverse if necessary.
	Delta/triangle key commutation time is too long.	Timer of seconds on contactor's coil is defective.
	Set time in 4 or 5 seconds adjusting timer of seconds.	Check if timer is inverting contacts in set time.
	Compressing unit locked.	Call technical assistance.

TROUBLESHOOTING TIPS

PROBLEM	PROBABLE CAUSE	WHAT TO DO
Compressor switches off and doesn't re-start even with low network pressure.	Overload relay activated.	Check current and overload relay.
	High temperature.	Check oil level and fill as needed with SCHULZ LUBE SH 46.
		Check fan (propeller) for breakage. Replace if necessary.
		Check if oil filter is for blockage filter change is with 300 working hours.
		Check if there is air flow in cooler core (Clean it if clogged).
		Look for oil leakage (repair leakage).
	Thermostatic valve malfunction.	Call technical assistance.
	Pressure switch malfunction P1-P2.	
	KT2 or K1 coil burnt.	Look for the cause according to diagram.
	No phase in the command.	
Compressor lost output suddenly. Pressure in the air network is very low. <i>Note: Before taking any action on the following discrepancy, read the "remarks" at the end of this chapter.</i>	Motor coil (auxiliar contactor KA1/KA2) burnt.	Call technical assistance.
	Loose or worn out belts.	Tighten or replace belts.
	Air filter clogged.	Check restriction indicator and air filter condition, replace if necessary.
	System pressure gauge hose is disconnected or leaking (Look for air leakage noise).	Connect hose or replace it.
	Solenoid valve coil burnt or with orifice clogged .	Call technical assistance.
	Pressure switch malfunction.	Reconnect or repair hose.
	Hose feeding solenoid valve is torn or disconnected.	
	Air leakage in some of the compressor's ducts.	Repair leakage.
	Air consumption much lower than compressor's production capacity.	Switch off some parallel compressor or install larger receiver.
	Discharge valve closed. (in this case, pressure in the network is very low).	Open the air discharge valve slowly.
Compressor with very fast load/unload cycles.	Pressure switch with small range.	Call technical assistance.
	High load loss near compressor.	Eliminate load loss.
	Excess oil in receiver.	Remove excess oil.
	Compressor's oil foaming.	Load and unload cycle is fast.
	Separator element compromised.	Replace separator element.
Oil by pass to system.	Oil filter clogged.	Replace it.
	Air filter clogged.	Replace it.
	Low oil level.	Evaluate cause and change oil using SCHULZ LUBE SH 46.
Compressor's overheating.	Cooler core clogged.	Clean it.
	Thermostatic valve malfunction.	Call technical assistance.

TROUBLESHOOTING TIPS

PROBLEM	PROBABLE CAUSE	WHAT TO DO
Excessive oil consumption. (Too much oil found in the air network).	Leakage in the circuit.	Locate and correct leakage.
	Return line of air/oil separator element is clogged.	Remove, clean and replace ducts.
	Separator element damaged.	Change air/oil separator element and service oil.
	Compressor's operating pressure below 3.4 bar (50 psig) for too long.	Check reason for excessive demand (reduce demand or add capacity).
Excessive noise or vibration.	Bearings of motor or unit damaged.	Call technical assistance.
	Cooling fan blade is broken or warped.	
	Loose or worn out belts.	
Safety valve opens repeatedly.	Air/oil separator element clogged.	Replace element.
	Inlet command valve stuck.	Call technical assistance.
	Defective solenoid valve (s) or pressure switch.	
	Minimum pressure check valve stuck.	
Too much water in air/oil receiver.	Compressor operating too much above the system capacity.	Check your air network consumption pattern. If the problem is not solved, call technical assistance.
Excess of water in the air receiver.	Failure in the electronic purger. Failure of manual draining in the receiver.	Change the electronic purger. Manually drain the air receiver.

REMARKS

If there is a pressure drop or a low pressure condition in the air network, monitor the compressor operation for the following:

- Before assuming a compressor malfunction, slowly close the discharge valve until closed and observe the length of time required to pressurize the compressor and monitor the motor's electrical consumption.
- If the compressor pressurizes normally, and the pressure shown on the display of the compressor's -Electronic Interface is high and yet the system in the facility remains low when the valve is opened, there is a in all likelihood a blockage in the system. (i.e. a freezing problem with the refrigerated dryer of a clogged filter) significant air loss in the air network.
- If the pressure in the compressor drops immediately with the opening of the valve and the compressor cannot maintain pressure then there is either a significant air loss in the network (i.e. stuck solenoid valve in regenerative dryer or faulty float drain in filter) or demand has increased due to a recent equipment installation. In this case, the necessary air demand is higher than production.
- If the compressor is compressing air at full load and the electrical consumption is within normal limits, the problem may not be the compressor itself.
- In any case, if a situation is not resolved through the use of the troubleshooting guide, consult your SCHULZ Authorized-Technical/Distributor.

SERVICE LOG

The purpose of this card is to provide a centralized location for the documentation of all service and maintenance performed on your compressor.

Careful maintenance of this record will help you to track equipment maintenance intervals and expenses, as well as schedule routine maintenance.

To facilitate accuracy and expedience when requesting services or materials, please have your compressor's model number, serial number and the service log available.

Compressor model		Air end model		Series n°	
				Cabinet	
Dealer		Purchase n°		Air end	
				_____/_____/_____ _____/_____/_____ _____/_____/_____	
First start date				Oil type	
Optional equipment					



NOTES

[illegible]

ROTARY SCREW COMPRESSOR

SRP 3015 - SRP 3020 - SRP 3030 - SRP 3050

SERVICE LOG

Date	Working hours	Ambient temperature	Compressor's temperature	Services: (Oil change, filter element change, re-fastening of electrical connections, etc.)  	Remark	Signature

TECHNICAL DELIVERY LOG

PRODUCT

Compressor model	Series nº	Air end model	bar	Voltage
SRP		Series nº		

DATE

SCHULZ AUTHORIZED TECHNICAL/DISTRIBUTOR	

DISTRIBUTOR/DEALER

Name

--

Address

--

City

State	Country

COSTUMER

Name

--

Address

--

City

State	Country

Person in charge of the equipment

Phone Nº

INSTALLATION

With air treatment unit

Brand	Model
YES <input type="checkbox"/> NO <input type="checkbox"/>	

With additional receiver

Capacity (liters)	Housed with cover
YES <input type="checkbox"/> NO <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
Nº Serie	

It has

Pre-filter <input type="checkbox"/>	Post-filter <input type="checkbox"/>	Adsorbent filter <input type="checkbox"/>	Automatic drain <input type="checkbox"/>	Others <input type="checkbox"/> _____
-------------------------------------	--------------------------------------	---	--	---------------------------------------

Use type

Location

Transport accessory

Distance from wall	Access to compressor
Removed <input type="checkbox"/>	Adequate <input type="checkbox"/> Inadequate <input type="checkbox"/>
In meters/inches	

Ventilation

Adequate <input type="checkbox"/>	Inadequate <input type="checkbox"/>	It has ventilation duct <input type="checkbox"/>	Ventilation access (m or inch)
			Door <input type="checkbox"/> x <input type="checkbox"/>
			Window <input type="checkbox"/> x <input type="checkbox"/>

Air network attached to compressor/receiver

With flexible tube <input type="checkbox"/>	With flange <input type="checkbox"/>	With expandable joint <input type="checkbox"/>	Others <input type="checkbox"/> _____
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Type of network

Open <input type="checkbox"/>	Closed in ring <input type="checkbox"/>	Stem type <input type="checkbox"/>	Ø air network* <input type="checkbox"/>
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* discharge ducts to network allow water to return to compressor

YES <input type="checkbox"/>	NO <input type="checkbox"/>
------------------------------	-----------------------------

Installation environment

Aggressive <input type="checkbox"/>	Regular <input type="checkbox"/>	Good <input type="checkbox"/>	Air filter	Standard <input type="checkbox"/>	Vehicular <input type="checkbox"/>	Others <input type="checkbox"/>
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ROTARY SCREW COMPRESSOR

SRP 3015 - SRP 3020 - SRP 3030 - SRP 3050

TECHNICAL DELIVERY LOG

STARTER TYPE

Direct start	<input type="checkbox"/>	Δ -Y	<input type="checkbox"/>	Soft start	<input type="checkbox"/>	Others	<input type="checkbox"/>	_____
--------------	--------------------------	-------------	--------------------------	------------	--------------------------	--------	--------------------------	-------

CONTROL TYPE

Analogical	Electronic	Another
<input type="text"/>	<input type="text"/>	<input type="text"/>

FIRST START

Electronic power network		Cable section	
Adequate	<input type="checkbox"/>	Inadequate	<input type="checkbox"/>
It has grounding	YES <input type="checkbox"/>	No, only neutral	<input type="checkbox"/>
		Input cable distance	<input type="checkbox"/> m or inch

Check	Adjustment start
Rotation direction <input type="checkbox"/>	Lubricant oil level <input type="checkbox"/>
Belt (s) tension <input type="checkbox"/>	_____seconds

Network voltage in operation V	Electric motor current Time Loaded Hrs A	Unloaded A
--------------------------------------	--	---------------

Check overload relay	Adjustment start	Check electric connection
Electric motor	<input type="checkbox"/> Second	Electric panel <input type="checkbox"/> Main electric motor <input type="checkbox"/>
A		

Protection (do not use automatic alarm system) Fuse NH A Diazed A Motor circuit breaker Adjustment A Unload time Adjustment minutes

Ambient temperature	Temperature during operation	Operation pressure	Unload pressure
$^{\circ}\text{C}/^{\circ}\text{F}$	$^{\circ}\text{C}/^{\circ}\text{F}$	barg	barg

Documents that follow the product	
Instruction Manual	<input type="checkbox"/>
Hydrostatic Test Sheet	<input type="checkbox"/>
Instruction Electric Motor	<input type="checkbox"/>
Instruction Electronic Drain	<input type="checkbox"/>

Customer instructed about			
Manual's contents	YES	NO	Preventive maintenance
	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>

Compressor meets user's demand

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	Post-sales	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	------------	-----	--------------------------	----	--------------------------

OPERATION

Compressor's technical start	Work mode until 15hp		Work compressor's minutes	
N° of hours <input type="text"/>	Intermittent <input type="text"/>	Continuous <input type="text"/>	Loaded <input type="text"/>	Unloaded <input type="text"/>
				Not unloaded <input type="text"/>

ADDITIONAL COMMENTS

[illegible]

Note: This card must return to the factory.

WARRANTY TERMS

Schulz Of America, Inc, within the limits of these terms, does grant this product's first buyer/end user a warranty against any material or manufacturing defect in the air end for a period of 2 (two) years from date of purchase invoice (or warranty registration by SCHULZ Authorized-Technical/Distributor) if and only if the with the following conditions are met:

- A.** The period for lubricant oil change is respected (air end).
- B.** Only approved lubricoolant and original SCHULZ repair/maintenance parts are used.
- C.** The compressor is not operated without air filter or with such a damaged one that effective filtration is lost, or with the air/oil separator element showing restriction on the panel in excess of recommended maintenance interval.(air end).

The remaining components of the compressor are warranted against manufacturing defects for a period of 1 (one) year (including the legal warranty period first 90 [ninety] days), from date of original purchase or warranty registration by SCHULZ Authorized-Technical/Distributor.

GENERAL WARRANTY CONDITIONS

- A.** This warranty shall only be considered valid if the start-up is performed and registered by your SCHULZ Authorized-Technical/Distributor and the presentation, to SCHULZ OF AMERICA, Inc, of the Technical Service Report and the Technical Delivery Log.
- B.** SCHULZ assumes no liability for lost production due to equipment malfunction.
- C.** No warranty service will be performed without the original purchase documentation.
- D.** Wearing parts, such as the ones below, which are naturally worn out by regular use and that are affected by the installation and the way the product is used are excluded from this warranty: air filter, oil filter, valves, hoses, bearings, oil seal, oil level sight, valves, belts, electric components, separator element and lubricant oil. SCHULZ OF AMERICA, Inc, will only assume responsibility for the servicing expenses of the above mentioned parts after evaluation by SCHULZ OF AMERICA, Inc, factory personnel and the identification of manufacturing defects.
- E.** This warranty will not apply to cleaning and installation services, roller bearings re-lubrication, adjustments requested by customer, change of lubricant oil and filters, nor to any damage caused to the product's external parts or damage in general due to incorrect use, neglect, modifications, external agents, use of improper attachments, inappropriate sizing for the application, shipping or delivery damage, physical modification (not authorized by SCHULZ OF AMERICA, Inc), use not in accordance with this instruction manual, inadequate electrical conductors, wrong voltage electrical connections or installation in a system subject to excessive voltage fluctuations.
- F.** Electric motor and electric switch manufacturers assume the warranty of their products if they fail for manufacturing defects. Defects resulting from installation errors are not covered by this warranty.
- G.** SCHULZ OF AMERICA, Inc, warrants that parts availability will be maintained (at SCHULZ AUTHORIZED-TECHNICAL/ DISTRIBUTOR) for a period not less than 5 (five) years from the last date of manufacture of a specific compressor model.

WARRANTY TERMINATION

This warranty will be considered void in the following situations:

- A.** At the end of its warranty period.
- B.** The product was delivered to be repaired or taken to another location by people/companies not authorized by SCHULZ OF AMERICA, Inc.
- C.** When signs of modification are noted.
- D.** When maintenance has not been performed to SCHULZ standards or repair parts used are not SCHULZ original parts.

WARNINGS

- A.** This compressor is supplied according to the customer's technical specifications at the time of ordering. It has specific displacement, pressure and voltage characteristics that cannot be changed, modified or altered in any way.
- B.** Lubrication of your rotary screw air compressor is fundamental. Maintenance of proper lubricoolant levels is paramount and has been discussed numerous times in this manual.
- C.** Expenses related to the servicing of the compressor which are judged to be outside the warranty parameters are the customer's responsibility.
- D.** Dealers, representatives or Schulz Authorized-Technical/Distributor are not authorized to change these terms or to assume responsibilities on behalf of SCHULZ OF AMERICA, Inc.
- E.** Drawings and photo are intended to show component flow and orientation only and are not intended to be a specification drawing. Specification drawings are available upon request from SCHULZ OF AMERICA, Inc, only.
- F.** The SCHULZ technician will provide service on a first come first served basis.
- G.** This SCHULZ product is supplied with tracking control of its components.

Note: SCHULZ OF AMERICA, Inc, reserves the right to make changes to these warranty policies without prior notice.

ENVIRONMENTAL GUIDANCE AND RECOMMENDATIONS

1. Disposal of Liquid Effluents

The presence of liquid effluents or non-treated condensation from receiver and separator in rivers, lakes or in other water receiving bodies may adversely affect the aquatic life and the water quality as well.

The condensation withdrawn from the receiver and separator, daily, according to the Preventive Maintenance Chapter, must be kept in a container and/or in an appropriate collecting network for further treatment.

SCHULZ OF AMERICA, Inc, recommends that the liquid effluent produced inside the receiver of the compressor or condensed separator should be adequately treated through processes that aim at protecting the environment and the healthy quality of life of the population, complying with the country's current regulation requirements.

Among the treatment methods available, one may choose the physical-chemical, chemical, and biological ones.

The treatment may be carried out by the company itself or by outsourcing.

2. Draining the Lubricant Oil from the Air/Oil Separator Receiver

The disposal of the lubricant oil coming from the lubricant oil change located either in the receiver of the screw compressor must meet technical requirements, as well as the regulation requirements of the current legislation of the country the product has been exported to.

3. Disposal of Solid Waste (parts in general and product packages)

The generation of solid waste is an important aspect that must be considered by the users when using and maintaining their piece of equipment. The impacts to the environment may cause meaningful changes in the quality of the soil, in surface and underground water, and in the population's health, due to the inadequate disposal of the discarded residues (on streets, water springs, landfills, etc).

SCHULZ OF AMERICA, Inc, recommends that the waste arising from the product, from its generation, handling, transportation, and treatment to its final disposal should be handled carefully. Appropriate handling should consider the following steps: quantification, qualification, classification, reduction at source, pick-ups and selective pick-ups, recycling, storage, transport, treatment and final destination.

The disposal of solid waste must be carried out according to the regulation requirements of the current legislation of the country the product has been exported to.

SCHULZ

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