

MODEL FF1600-E

PROPORTIONING UNIT

Parts Identification

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Parts Identification

NOTICE:

The equipment described in this technical manual must only be operated or serviced by properly trained individuals, thoroughly familiar with the operating instructions and limitations of the equipment. For technical service, call your local distributor.



NOTICE:

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WARRANTY GUSMER EUROPE, S.A.

GUSMER EUROPE provides a limited warranty to the original purchaser (Customer) of GUSMER EUROPE manufactured parts and equipment (Product) against any defects in material or workmanship for a period of one year from the date of shipment from GUSMER EUROPE facilities.

In the event Product is suspected to be defective in material or workmanship, it must be returned to GUSMER EUROPE, freight prepaid. If Product is found to be defective in material or workmanship, as determined solely by GUSMER EUROPE, GUSMER EUROPE will issue full credit to Customer for the freight charges incurred in returning the defective Product, and either credit will be issued for the replacement cost of the Product or a replacement part will be forwarded no-charge, freight prepaid to Customer.

This warranty shall not apply to Product GUSMER EUROPE finds to be defective resulting from: installation, use, maintenance, or procedures not accomplished in accordance with our instructions; normal wear; accident; negligence; alterations not authorized in writing by GUSMER EUROPE; or Product used in conjunction with any other manufacturer's pumping or proportioning equipment. Further, the terms and conditions of this warranty shall not apply to services or repairs made to Product by any third party not authorized in writing by GUSMER EUROPE. For such Product, a written estimate will be submitted to Customer at a nominal service charge, itemizing the cost for repair. Disposition of Product will be done in accordance with the terms stated on the written estimate.

The warranty provisions applied to product that are not manufactured by GUSMER EUROPE will be solely in accordance with the warranty provided by the original manufacturer of the product.

GUSMER EUROPE MAKES NO WARRANTY WHATSOEVER AS TO THE MERCHANTABILITY OF, OR SUITABILITY FOR, ITS PRODUCT TO PERFORM ANY PARTICULAR PURPOSE. CREDIT FOR, OR REPLACEMENT OF, PRODUCT DEFECTIVE IN MATERIAL OR WORKMANSHIP SHALL CONSTITUTE COMPLETE FULFILLMENT OF GUSMER EUROPE OBLIGATIONS TO CUSTOMER. NO OTHER WARRANTY, EXPRESSED OR IMPLIED ON ANY PRODUCT IT MANUFACTURES AND/OR SELLS, WILL BE RECOGNIZED BY GUSMER EUROPE UNLESS SAID WARRANTY IS IN WRITING AND APPROVED BY AN OFFICER OF GUSMER EUROPE.

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FINAL ASSEMBLY

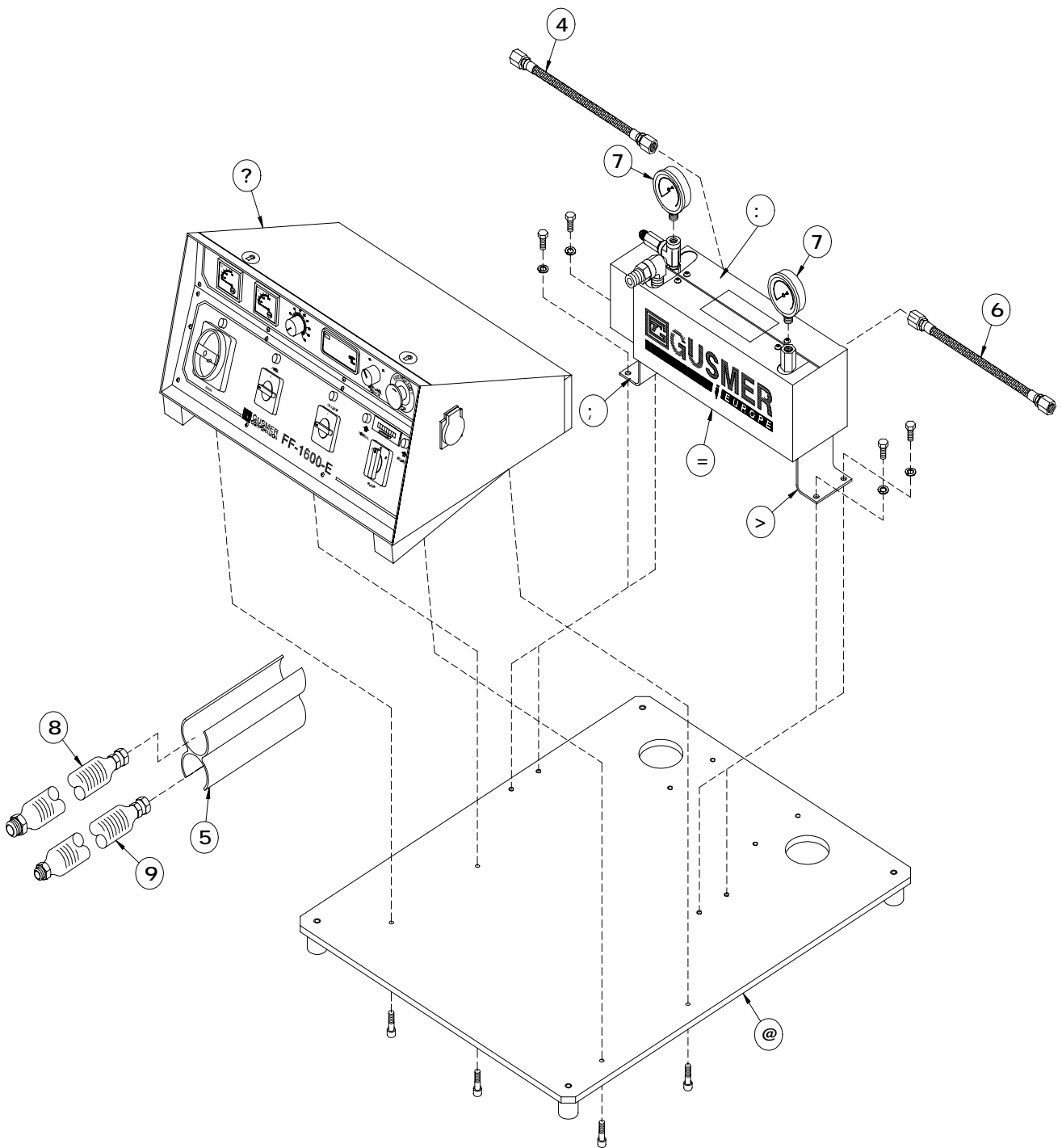


Figure 1. FF1600-E Final Assembly, Exploded View, Sheet 1 of 2

TABLE 1. FF1600-E FINAL ASSEMBLY, PARTS, SHEET 1 OF 2

Reference Letter	Part Number	Description	Quantity
A	0372	Interconnect Hose	1
B	5204	Electrical Insulator	1
C	6313-6	Interconnect Hose	1
D	17001	0-3000 PSI Gauge	2
E	56273	R-Isolation Hose	1
F	56274	A-Isolation Hose	1
G	110-00009-000	A-Heater Cover	1
H	089-00056-011	Left heater support	1
J	110-00008-000	R-heter Cover	1
K	089-00056-010	Right heater support	1
L	030-00004-000	Electrical Console Assembly	1
M	089-00016-000	Base Assembly	1

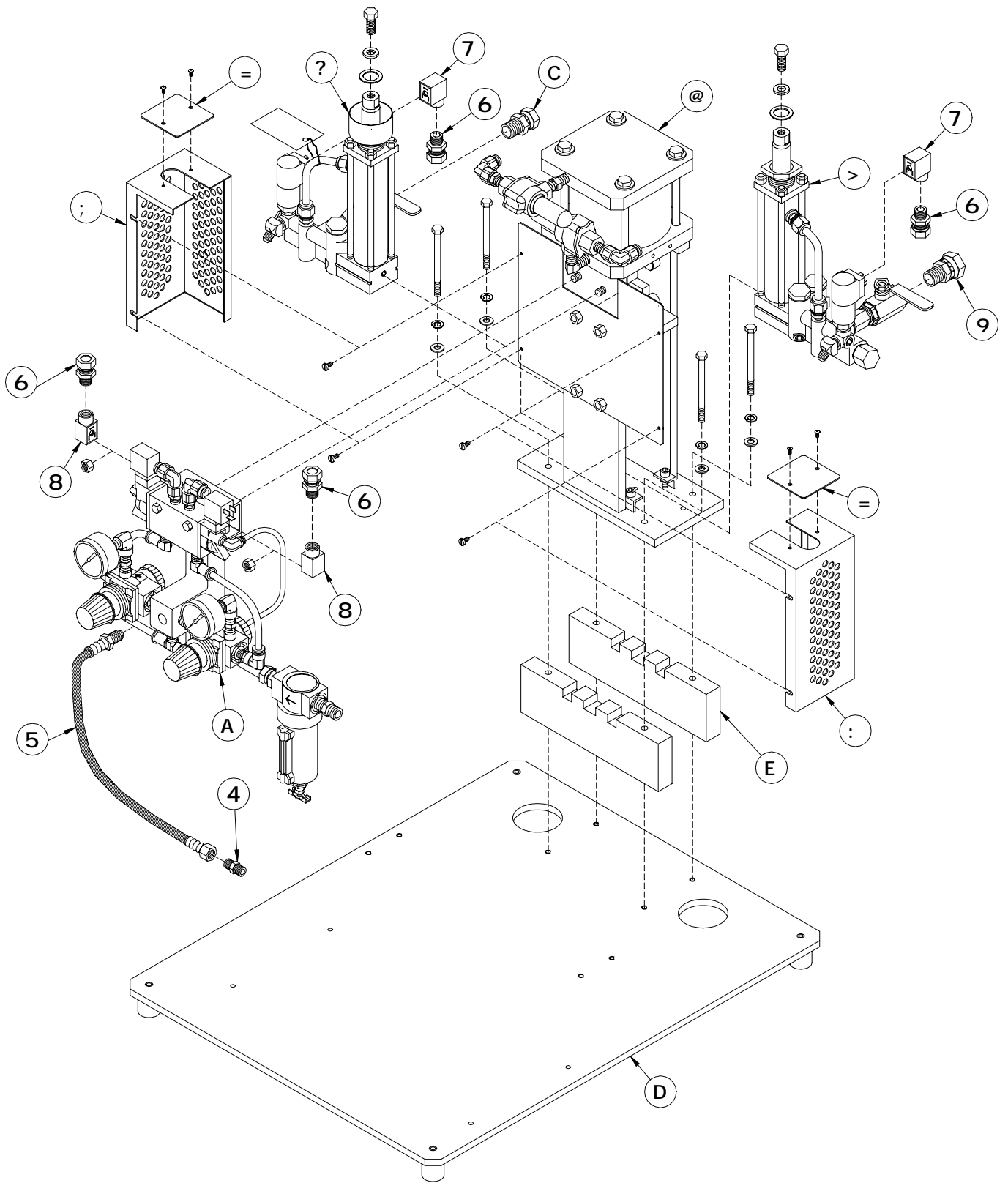


Figure 2. FF1600-E Final Assembly, Exploded View, Sheet 2 of 2

TABLE 2. FF1600-E FINAL ASSEMBLY, PARTS, SHEET 2 OF 2

Reference Letter	Part Number	Description	Quantity
A	0561	Hex Nipple	1
B	5270A-4	Air Hose	1
C	5621-136-22-1	Straight Connector	4
D	6690-16-76-1	Din connector	2
E	8680-3-2	Din Connector	2
F	10420	Swivel Union	1
G	57002-2	Yoke Left Cover Guard	1
H	57002-3	Yoke Right Cover Guard	1
J	57002-4	Yoke Access Plate	2
K	57400-SIZE	Resin Proportioning Pump Assembly	1
L	57450-SIZE	Iso Proportioning Pump Assembly	1
M	57755	Air Motor Assembly (16:1 Ratio)	1
	57796	Air Motor Assembly (10:1 Ratio)	1
N	17756	Air Control System	1
P	OP179-6	Swivel Union	1
Q	089-00016-000	Base Assembly	1
R	57754	Air Motor Standoff	2

ELECTRICAL CONSOLE

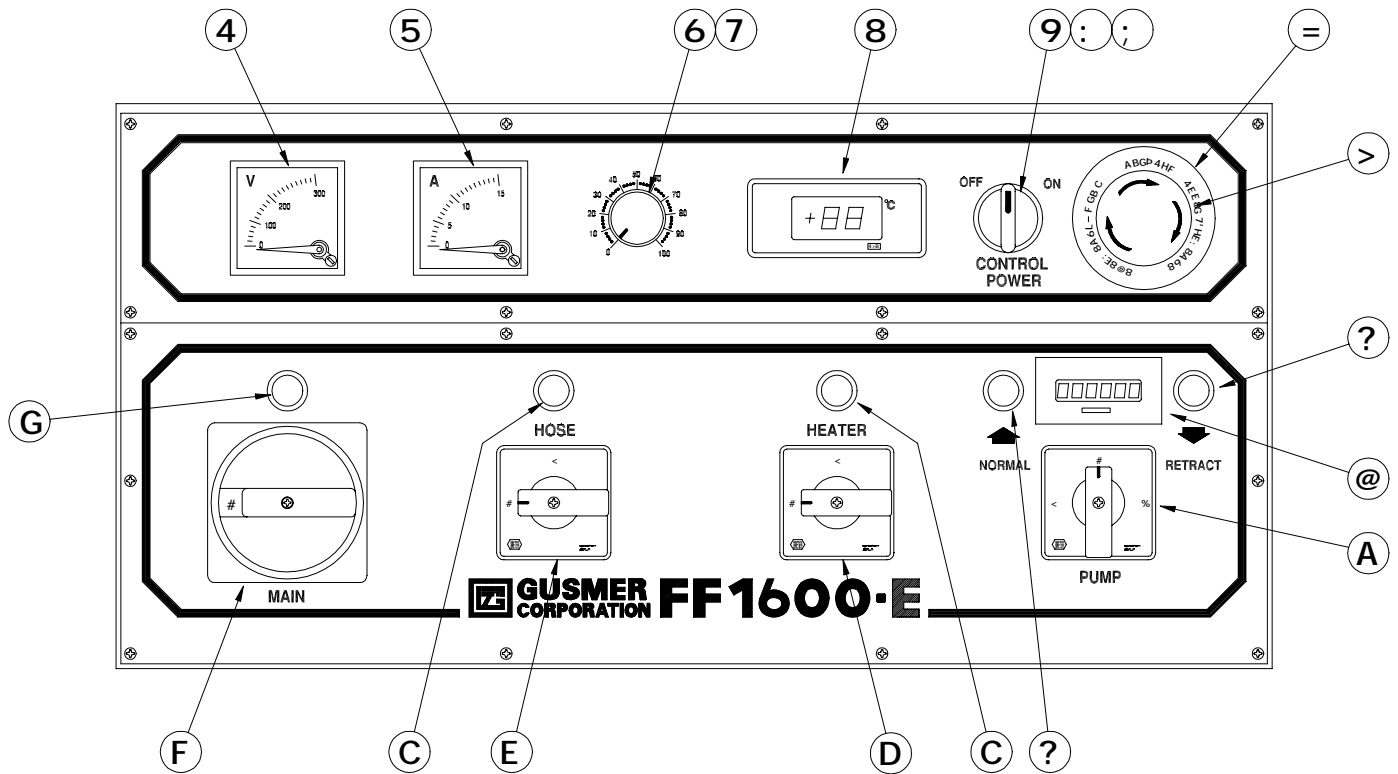


Figure 3. Electrical Console (Part No. 030-00004-000), Sheet 1 of 2

TABLE 3. ELECTRICAL CONSOLE, FRONT VIEW, PARTS, SHEET 1 OF 2

Reference Letter	Part Number	Description	Quantity
A	047-00003-000	Voltmeter	1
B	047-00002-000	Ammeter	1
C	6690-5-17	Potentiometer	1
D	054-00001-000	Knob	1
E	047-00014-000	Digital Thermometer	1
F	042-00007-000	Lighted Switch Body	1
G	042-00016-000	Switch Contact	1
H	042-00001-000	Lamp	1
J	042-00006-000	Emergency Switch	1
K	042-00017-000	Emergency Bezel	1
L	042-00009-000	Pilot Light:Amber;24V	2
M	9651-6-2	Counter	1
N	042-00005-000	Comutating Switch	1
P	042-00008-000	Pilot Light:Green;220V	2
Q	042-00003-000	Switch	1
R	042-00004-000	Switch	1
S	042-00002-000	Switch	1
T	042-00010-000	Pilot Light:Green;24V	1

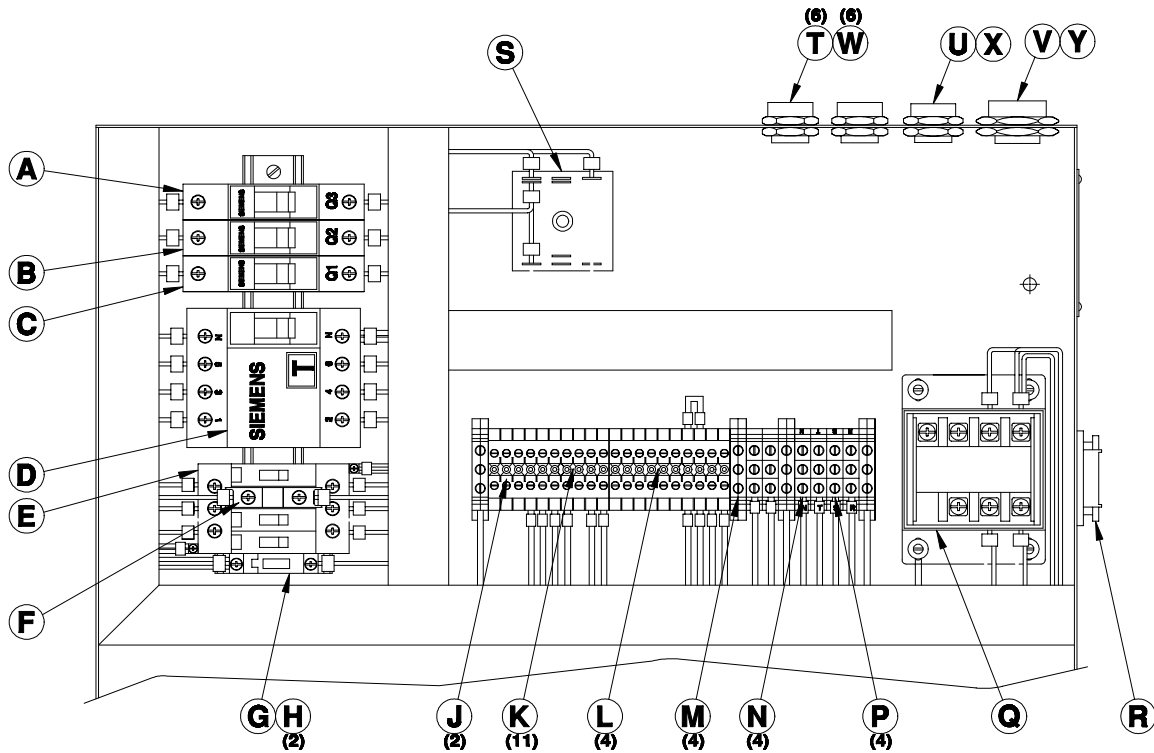


Figure 4. Electrical Console (Part No. 030-00004-000), Sheet 2 of 2

TABLE 4. ELECTRICAL CONSOLE, INTERIOR VIEW, PARTS, SHEET 2 OF 2

Reference Letter	Part Number	Description	Quantity
A	050-00006-000	Circuit Breaker: 3A.	1
B	050-00005-000	Circuit Breaker: 10A.	1
C	050-00004-000	Circuit Breaker: 25A.	1
D	050-00001-000	Voltage Differential Switch	1
E	041-00002-000	Contactor	1
F	041-00001-000	Auxiliary Contact	1
G	050-00002-000	Fuse Terminal	1
H	050-00003-000	Fuse	2
J	045-00004-000	Block	2
K	041-00008-000	Terminal Jumper	11
L	050-00012-000	Terminal Separator	1
M	045-00001-000	Terminal Block:Yellow\Green;6mm	4
N	045-00001-001	Terminal Block:Blue;6mm	2
P	045-00001-002	Terminal Block:Brown;6mm	4
Q	040-00001-000	Transformer	1
R	045-00023-000	DAC Socket	1
S	6690-26-18	Triac	1
T	044-00006-000	Bushing	6
U	044-00008-000	Bushing	1
V	044-00009-000	Bushing	1
X	044-00013-000	Nut	6
Y	044-00015-000	Nut	1
Z	044-00016-000	Nut	1

TABLE 5. 16:1 RATIO AIR MOTOR (PART NO. 57755), PARTS

Reference Letter	Part Number	Description	Quantity
A	0466A	Hex Nipple	1
B	0551	O-Ring	1
C	0557	Piston Rod Nut	1
D	0562-12	Exhaust Valve	2
E	0751	Proportioning Unit Base	1
F	0752	Air Cylinder Upright	1
G	0753	Air Cylinder Upright-Sw Side	1
H	0754	Socket Head Cap Screw	10
J	0755-1	Bearings	12
K	0755-2	Cam Roller Stud	12
L	0756	Hex Nut	12
M	0757A	Pump Yoke	1
N	0765	Pump Mounting Bracket	4
P	1516A-3	Washer	4
Q	14501-20	Elbow	1
R	17002	Muffler	2
S	17745-1	Air Cylinder Top Plate	1
T	17745-2	Air Cylinder Bottom Plate	1
U	17745-3	Air Cylinder	1
V	17745-4	Socket Head Cap Screw	4
W	17745-5	Air Piston W/Rod	1
X	17745-6	Air Cylinder Adapter	2
Y	17745-7	O-Ring	2
Z	17745-8	O-Ring	1
AA	17745-9	Hex Head Cap Screw	4
AB	20042	Tube Fitting	2
AC	57745-10	Reversing Switch Assembly	1
AD	57002-1	Yoke Rear Cover Guard	1

Air Cylinder Rebuild Kit (Part # 17745-3-1)- which includes B, Y, Z, & Air Cylinder Lubricant (Part #553-2), order as required from your local distributor.

Exhaust Valve Repair Kit (Part # 0562-12-1)- order as required from your local distributor.

10:1 RATIO AIR MOTOR (OPTIONAL)

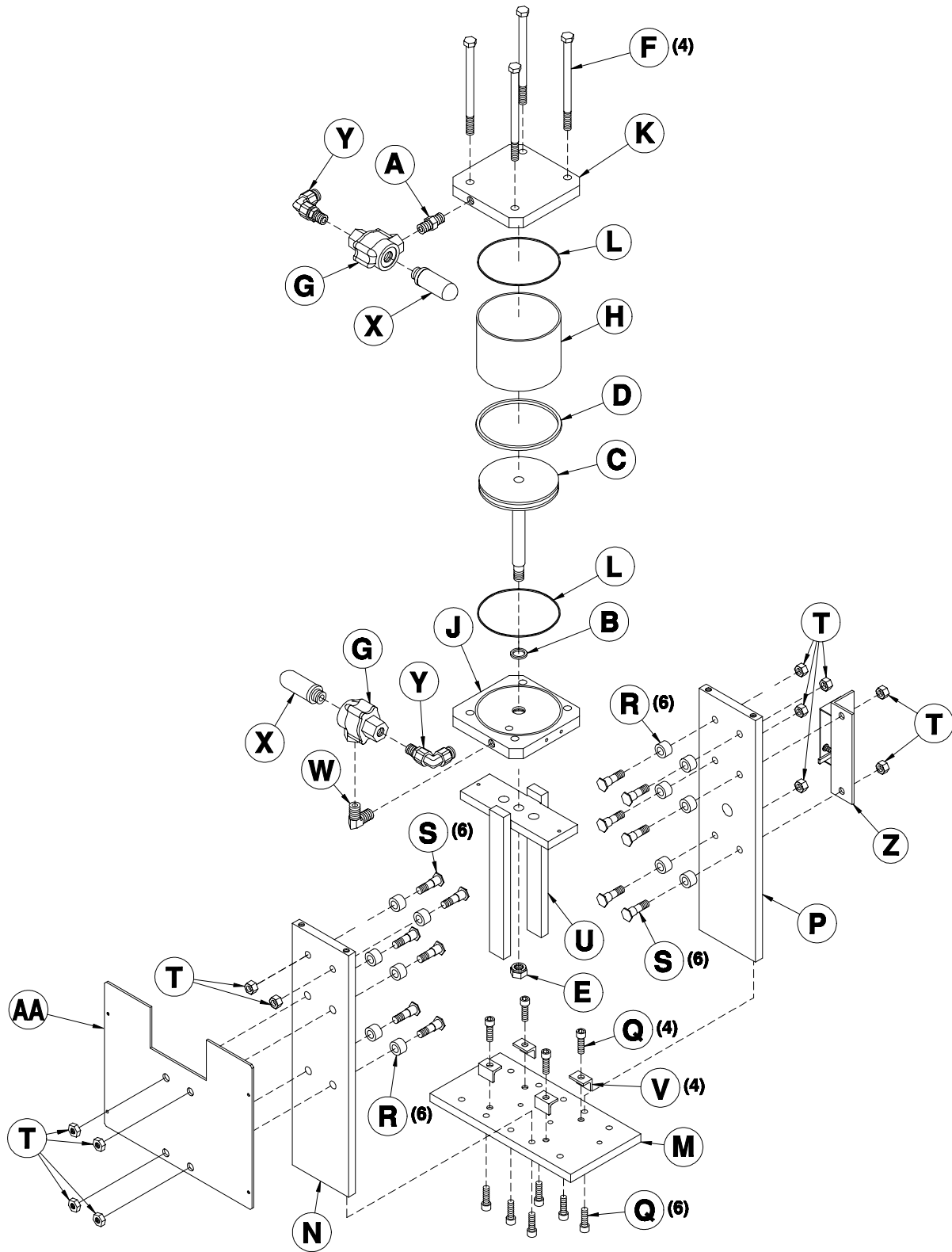


Figure 6. 10:1 Air Motor (Part No. 57796), Exploded View

TABLE 6. 10:1 AIR MOTOR (PART NO. 57796), PARTS

Reference Letter	Part Number	Description	Quantity
A	0466A	Hex Nipple	1
B	0551	O-Ring	1
C	0555	Air Piston w/Rod	1
D	0556	O-Ring	1
E	0557	Piston Rod Nut	1
F	0558	Hex Head Cap Screw	4
G	0562-12	Exhaust Valve	2
H	0746-1	Air Cylinder	1
J	0746-2	Air Cylinder Bottom Plate	1
K	0746-3	Air Cylinder Top Plate	1
L	0746-4	O-Ring	2
M	0751	Proportioning Unit Base	1
N	0752	Air Cylinder Upright	1
P	0753	Air Cylinder Upright-Sw Side	1
Q	0754	Socket Head Cap Screw	10
R	0755-1	Bearings	12
S	0755-2	Cam Roller Stud	12
T	0756	Hex Nut	12
U	0757A	Pump Yoke	1
V	0765	Pump Mounting Bracket	4
W	14501-20	Elbow	1
X	17002	Muffler	2
Y	20042	Tube Fitting	2
Z	57745-10	Reversing Switch Assembly	1
AA	57002-1	Yoke Rear Cover Guard	1

Air Cylinder Rebuild Kit (Part # 0746-1-1)- which includes B, D, L, & Air Cylinder Lubricant (Part #553-2), order as required from your local distributor.

Exhaust Valve Repair Kit (Part # 0562-12-1-D)- order as required from your local distributor.

REVERSING SWITCH

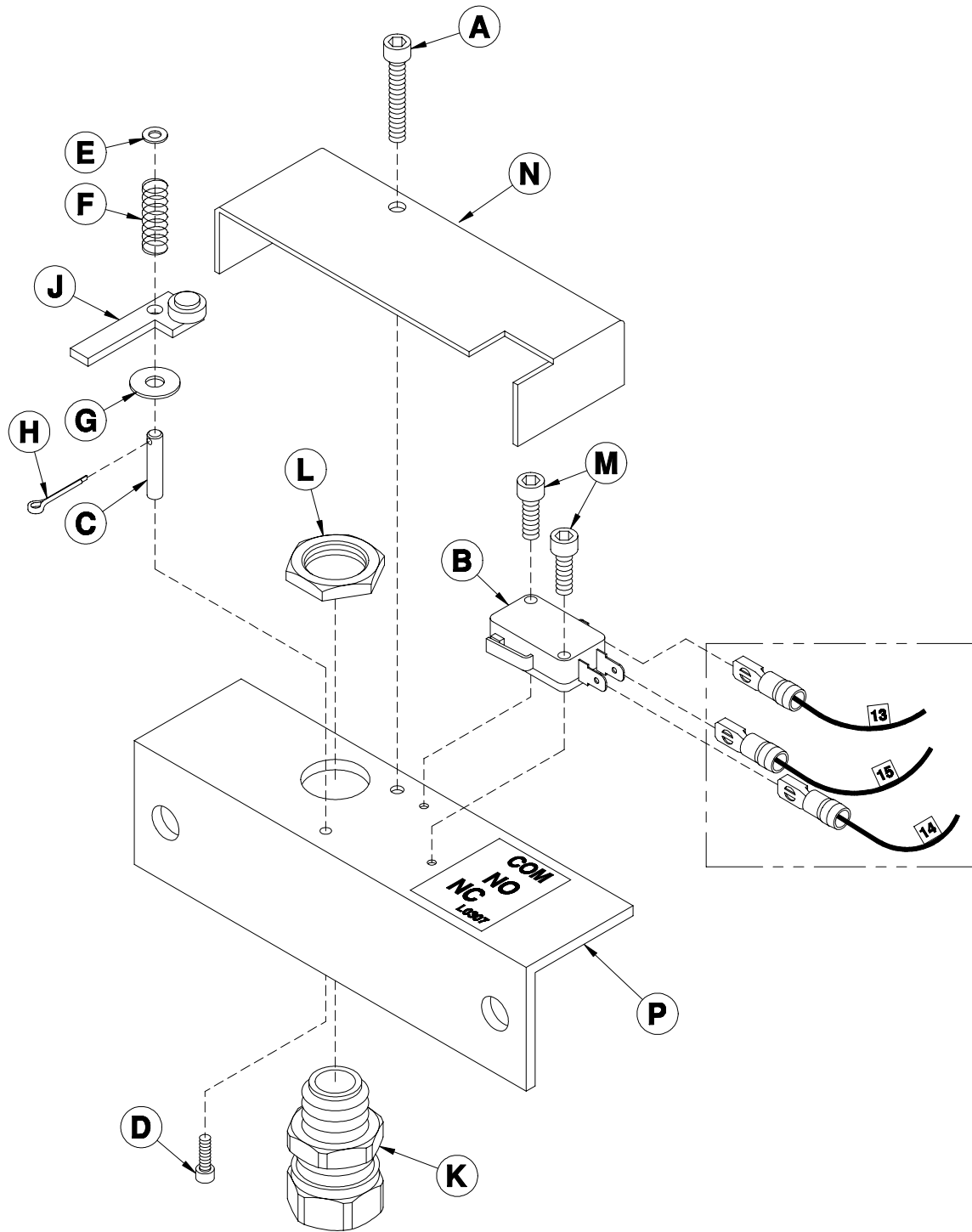


Figure 7. Reversing Switch (Part No. 57745-10), Exploded View

TABLE 7. REVERSING SWITCH (PART NO. 57745-10), PARTS

Reference Letter	Part Number	Description	Quantity
A	0577-3	Socket Head Cap Screw	1
B	0578A	Reversing Switch Cover	1
C	0579-2	Pivot Arm	1
D	0579-3	Socket Head Cap Screw	1
E	0579-4	Flat Washer	1
F	0579-5	Spring	1
G	0579-6	Fiber Washer	1
H	0579-7	Cotter Pin	1
J	0579A-1	Reversing Switch Lever	1
K	5621-136-22	Straight Connector	1
L	5621-136-24	Locknut	1
M	9577-10	Socket Head Cap Screw	2
N	57577	Reversing Switch Cover	1
P	57578	Reversing Switch Bracket Assembly (Includes C, D, and M)	1

AIR CONTROL SYSTEM

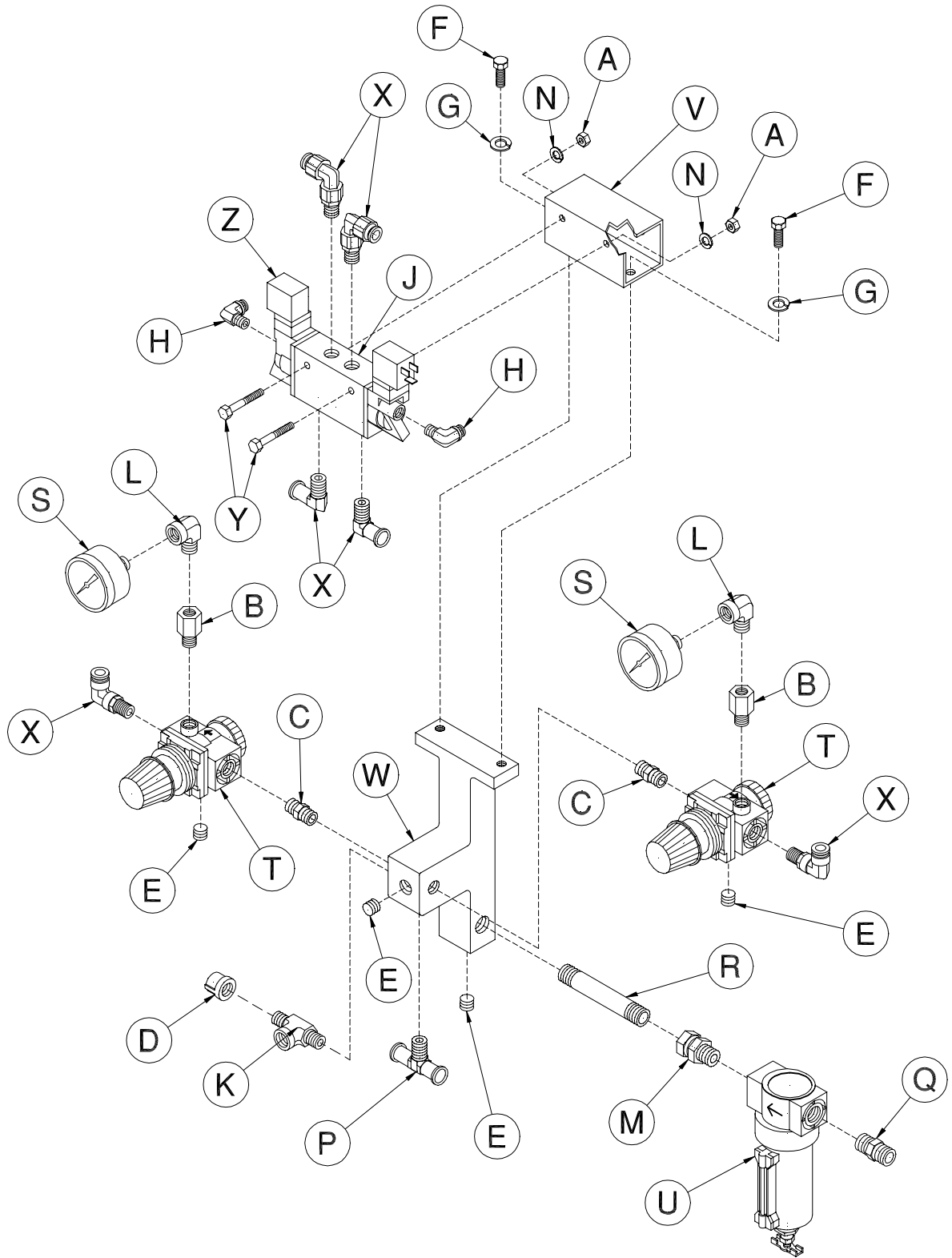


Figure 8. Air Control System (Part No. 17756), Exploded View

TABLE 8. AIR CONTROL SYSTEM (PART NO. 17756), PARTS

Reference Letter	Part Number	Description	Quantity
A	0385-4	Hex Nut	2
B	075-00081-000	Swivel Union	2
C	0561	Swivel Union	4
D	0575	Pipe Cap	1
E	0576	Pipe Plug	4
F	1701-4	Hex Head Cap Screw	2
G	5504-3	Lockwasher	2
H	6306-3	Tube Fitting	2
J	6311-109	Valve (Includes Z)	1
K	6304-21	Pipe Branch Tee	1
L	0375B-2	Street Elbow	2
M	9457	Swivel Union	1
N	9758	Lockwasher	2
P	17746-5	Pipe Branch Tee	1
Q	17746-7	Hex Nipple	1
R	17746-12	Pipe Nipple	1
S	17746-13	Pressure Gauge	2
T	17756-1	Regulator	2
U	17756-3	3/8 FPT Filter	1
V	17756-4	Mounting Bracket	1
W	17756-7	Air Manifold	1
X	20042	Tube Fitting	6
Y	IP1119	Hex Head Cap Screw	2
Z	17756-2-24	Coil	2
Not Shown	8680-3-2	Din Connector	2

Spool Assembly Replacement (Part # 17756-2-1)- Order as required from your local distributor.

Repair Kit (Part # 17756-2-3)- Order as required from your local distributor

Valve Modification/Rebuild Kit (Part # 6311-109-1)- Two required per valve assembly. Does not include Spool Assembly. Order as required from your local distributor

Regulator Rebuild Kit (Part # MK17756-1)- Order as required from your local distributor

PRIMARY HEATER

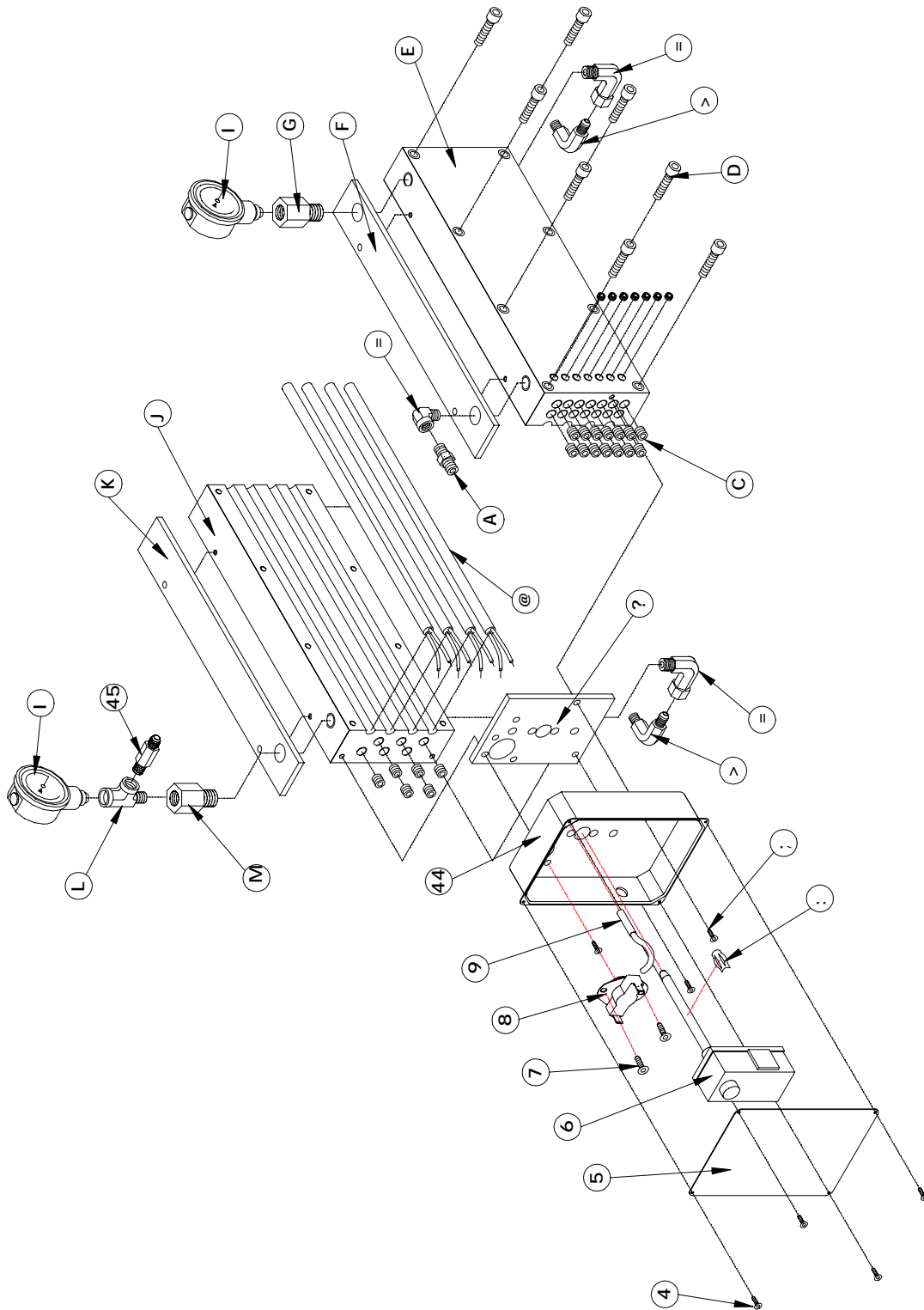


Figure 9. Primary Heater, (Part No. 57350-GE), Exploded View

TABLE 9. PRIMARY HEATER, PARTS

Reference Letter	Part Number	Description	Quantity
A	080-00003-000	Screw	4
B	043-00019-001	Conection box cover	1
C	047-00011-000	Thermal switch	1
D	080-00002-000	Screw	2
E	047-00010-000	Thermal limit switch	1
F	049-00001-000	Thermocouple	1
G	047-00011-001	Fixing thermostat	1
H	080-00006-000	Screw	3
J	0375B-2	Male elbow	3
K	075-00019-000	Male elbow	2
L	090-00003-000	Insulate plate	1
M	049-00002-000	Heat resistance	4
N	075-00018-000	Hose nipple	1
P	078-00009-000	Pipe plug	52
Q	080-00069-000	Screw	8
R	085-00008-000	R-heat front plate	1
S	090-00008-000	R-top insulate plate	1
T	15521	Bushing	1
V	17001	Manometer	2
W	085-00009-000	A-heat plate	1
X	090-00009-000	A-top insulate plate	1
Y	6465	Pipe tee	1
Z	17357	Bushing	1
AA	043-00026-000	Connection box	1
AB	0375C-3	Hose nipple	1

PROPORTIONING PUMP

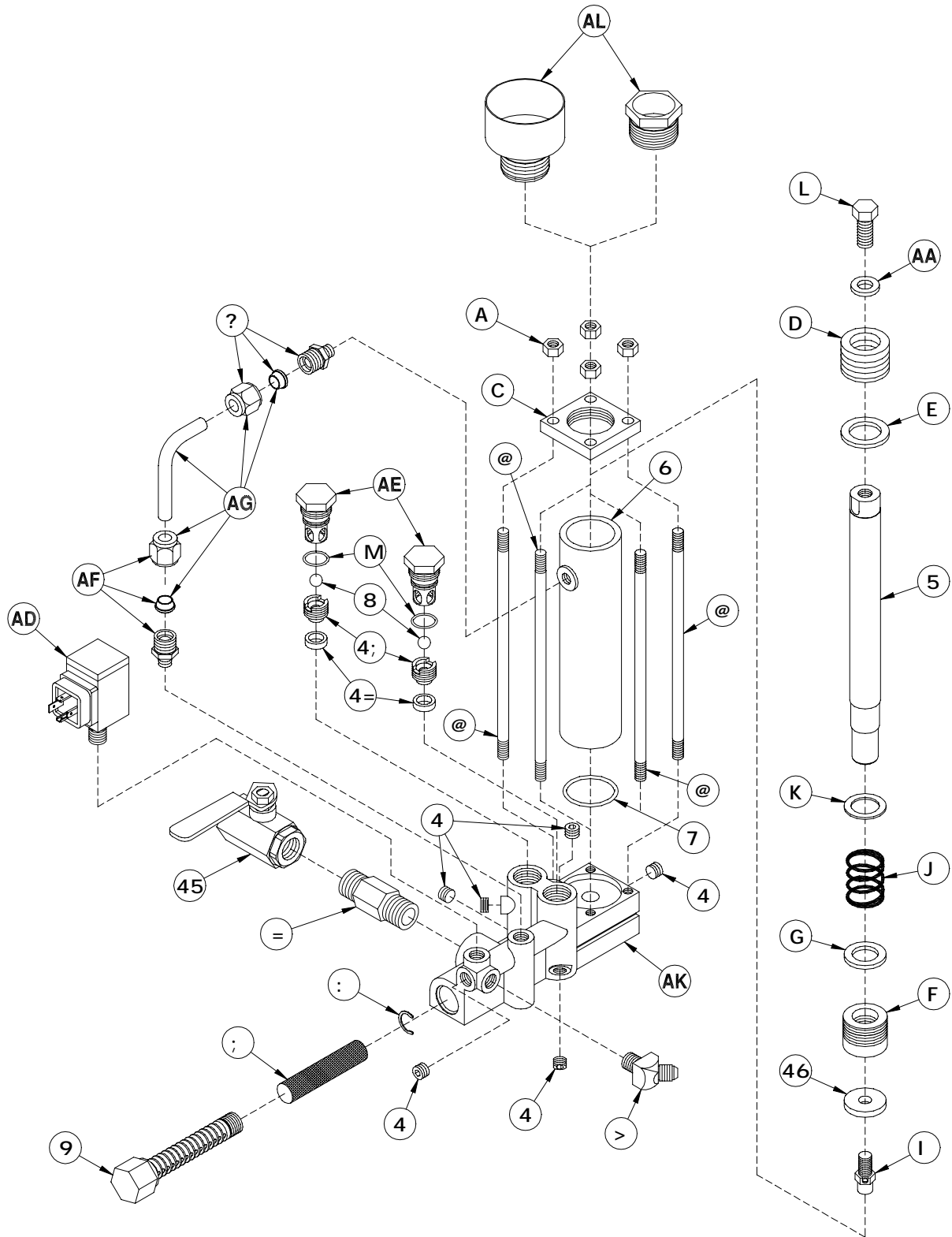


Figure 10. Proportioning Pump (Part No. 57400-SIZE and 57450-SIZE), Exploded View

TABLE 10. PROPORTIONING PUMP (PART NO. 57400-SIZE AND 57450-SIZE), PARTS

Reference Letter	Part Number	Description	Quantity
A	0377	Pipe Plug	6
B*	0451A-SIZE	Pump Piston Rod	1
C*	0452B-SIZE	Pump Cylinder	1
D	0453	O-Ring	1
E	0455	Valve Ball	2
F	0460	Screen Screw	1
G	0461	Snap Ring	1
H	0462	Pump Screen	1
J	0463	Hex Nipple	1
K	0465	Hose Elbow	1
L	0470	Tube Nipple	1
M	56427	Tie Rod	4
N	0473	Hex Nut	4
P	0474	Cylinder Top	1
Q*	0476-SIZE	Packing Set	1
R*	0477-SIZE	Packing Support Washer	1
S*	0478A-SIZE	Packing Set	1
T*	0479-SIZE	Packing Support Washer	1
U*	0480D-SIZE	Packing Retainer Bolt	1
V*	0481-SIZE	Conical Spring	1
W*	0482-SIZE	Spring Retainer Washer	1
X*	0483-SIZE	Hex Head Cap Screw	1
Y	0485	O-Ring	2
Z*	0486-SIZE	Washer	1
AA	0487A	Ball Valve	1
AB*	0488-SIZE	Packing Retainer Washer	1
AC*	0475-SIZE	R-Packing Nut	1
	0489-SIZE	A-Packing Nut w/Lube Cup	
AD	0562-15	Swivel Union	1
AE	6690-16-772000R	Pressure Switch	1
AF	17402	Check Valve Retainer	2
AG	17404	Tube Fitting	1
AH	17405	Crossover Tube w/Ferrule	1
AJ	17406	Check Valve Seat	2
AK	17407	Check Valve Seal	2
AL	17428	Resin Pump Base (Includes A)	1
	17478	Iso Pump Base (Includes A)	

* Refer to Tables 11 and 12 for a schedule of parts.

Parts Identification

TABLE 11. SCHEDULE OF PARTS - PUMP SIZES 15 THROUGH 30

Reference Letter	Pump Sizes				
	15	19	22	24	30
B	451A-15	451A-19	451A-22	451A-24	451A-30
C	452B-15	452B-19	452B-22	452B-24	452B-30
Q	476-15	476-19	476-22	476-24	476-30
R	477-15	477-19	477-22	477-24	477-30
S	478-15	478-19	478-22	478-24	476-19
T	479-15	479-19	479-22	479-24	479-30
U	480D-22/15	480D-22/15	480D-22/15	480D-30/24	480D-30/24
V	481-15	481-22/19	481-22/19	481-24	481-30
W	482-15	482-19	482-22	482-24	482-30
X	483-5/16	483-5/16	483-5/16	483-3/8	483-3/8
Z	486-5/16	486-5/16	486-5/16	486-3/8	486-3/8
AB	488-15	488-19	488-22	488-24	488-30
AC	475-15	475-19	475-22	475-24	475-30
	489-15	489-19	489-22	489-24	489-30

TABLE 12. SCHEDULE OF PARTS - PUMP SIZES 40 THROUGH 60

Reference Letter	Pump Sizes					
	40	44	48	52	56	60
B	451A-40	451A-44	451A-48	451A-52	451A-56	451A-60
C	452B-40	452B-44	452B-48	452B-52	452B-56	452B-60
Q	476-40	476-44	476-48	476-52	476-56	476-60
R	477-40	477-44	477-48	477-52	477-56	477-60
S	478-40	478-44	478-48	478-52	478-56	478A-60
T	479-40	479-44	479-48	479-52	479-56	479-60
U	480D-60/40	480D-60/40	480D-60/40	480D-60/40	480D-60/40	480D-60/40
V	481-44/40	481-44/40	481-60/48	481-60/48	481-60/48	481-60/48
W	482-40	482-44	482-48	482-52	482-56	482-60
X	483-7/16	483-7/16	483-7/16	483-7/16	483-7/16	483-7/16
Z	486-7/16	486-7/16	486-7/16	486-7/16	486-7/16	486-7/16
AB	488-40	488-44	488-48	488-52	488-56	488-60
AC	475-40	475-44	475-48	475-52	475-56	475-60
	489-40	489-44	489-48	489-52	489-56	489-60

AUTO POWER PACK

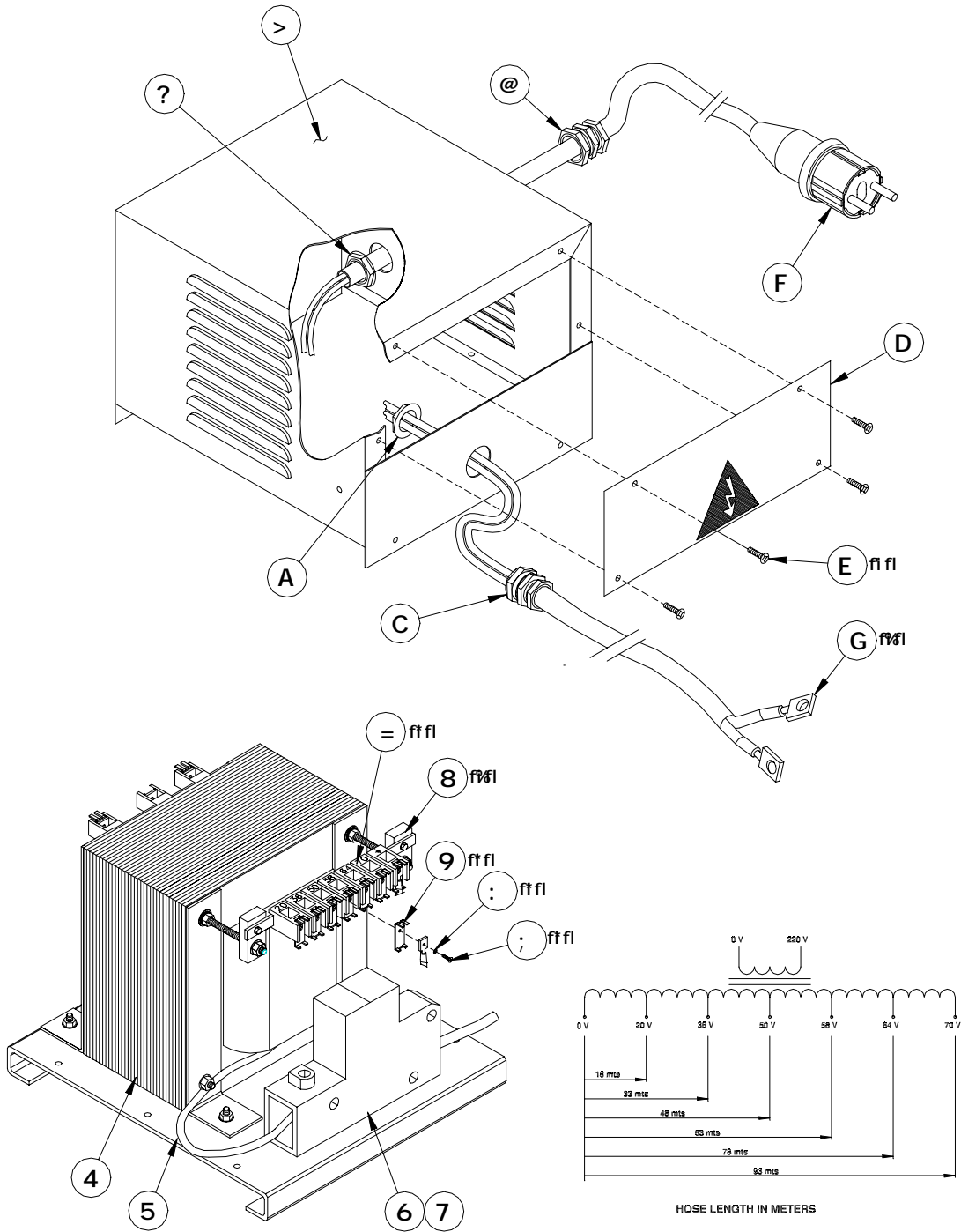


Figure 11. Auto Power Pack (Part No. 57276E), Exploded View

Parts Identification**TABLE 13. AUTO POWER PACK (PART NO. 57276E), PARTS**

Reference Letter	Part Number	Description	Quantity
A	040-00004-000	Transformer	1
B	040-00004-002	Transformer Base	1
C	040-00003-003	Fuse Holder Base	1
D	040-00003-004	Fuse	1
E	040-00004-003	Insulating Fixing Terminal	2
F	040-00004-004	Terminal Clamp	7
G	040-00004-005	Washer	7
H	040-00004-006	Screw	7
J	040-00004-007	Terminal	7
K	040-00003-016	Transformer Casing	1
L	044-00015-000	Nut	1
M	044-00008-000	Bushing	1
N	044-00015-001	Nut	1
P	044-00008-001	Bushing	1
Q	040-00003-017	Transformer Casing Top	1
R	040-00003-018	Screw	4
S	045-00024-000	DAC Socket	1
T	045-00025-000	Ring Terminal	2

ELECTRICAL SCHEMATIC DIAGRAMS

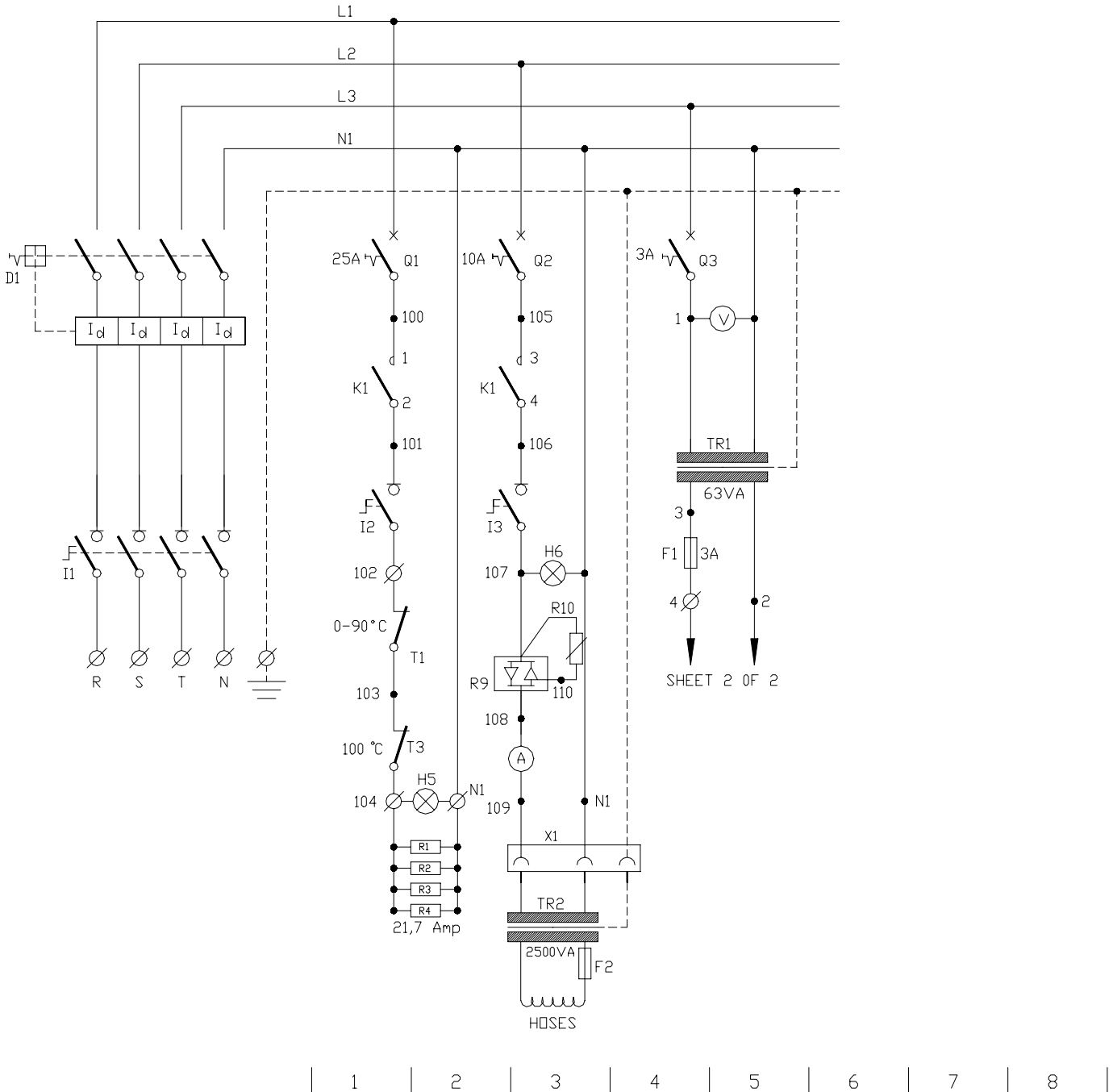


Figure 12. FF1600-E Schematic Diagram, Sheet 1 of 2

TABLE 14. FF1600-E SCHEMATIC DIAGRAM, PARTS LIST

Reference Letter	Part Number	Description	Quantity
A	047-00002-000	AMMETER	1
B1	0578A	REVERSING SWITCH	1
B2-B3	6690-16-772000R	PRESSURE SWITCH	2
D1	050-00001-000	VOLTAGE DIFFERENTIAL SWITCH	1
F1	050-00003-000	FUSE	1
F2	040-00003-004	FUSE TRANSFORMER	1
H1	042-00010-000	PILOT LIGHT:GREEN;24V	1
H2	042-00001-000	LAMP	1
H3-H4	042-00009-000	PILOT LIGHT:AMBER;24V	2
H5-H6	042-00008-000	PILOT LIGHT:GREEN;220V	2
I1	042-00002-000	SWITCH	1
I2	042-00003-000	SWITCH	1
I3	042-00004-000	SWITCH	1
I4	042-00005-000	COMUTATING SWITCH	1
K1	041-00002-000	CONTACTOR	1
P1	9651-6-2	COUNTER	1
P2	047-00014-000	DIGITAL THERMOMETER	1
Q1	050-00004-000	CIRCUIT BREAKER: 25A.	1
Q2	050-00005-000	CIRCUIT BREAKER: 10A.	1
Q3	050-00006-000	CIRCUIT BREAKER: 3A.	1
R10	6690-5-17	POTENTIOMETER	1
R1-R4	0361-1250	HEAT RESISTANCE	4
R9	6690-26-18	TRIAC	1
S1	042-00006-000	EMERGENCY SWITCH	1
S2	042-00007-000	LIGHTED SWITCH BODY	1
S2	042-00016-000	SWITCH CONTACT	1
T1	0362C	THERMAL LIMIT SWITCH	1
T3	6690-7-29	THERMOSTAT	1
TR1	040-00001-000	TRANSFORMER	1
TR2	57276E	POWER PACK ASY FF1600-E	1
V	047-00003-000	VOLTMETER	1
Y1-Y2	17756-2-24	COIL	2

Field Number	Field Title	Description
1	Date	Enter date report is submitted.
2	Name	Enter name of person making report.
3	IM Number	Enter the Part Number of the Instruction Manual from the title page.
4	Issue Number	Enter the Issue number of the Instruction Manual from the title page. If there is no issue number enter NONE .
5	Date of Issue	Enter the date of Issue of the Instruction Manual from the title page. If there is no issue date enter NONE .
6	Page Number	Enter the page number containing the discrepancy
7	Discrepancy	Provide a brief description of discrepancy

NOTE: You may send a marked copy of the page as an attachment to your submittal.