Sohal®

2016

INVERTER MIG - MAG / ARC WEDER

DRX

MANUAL

MODELS:
SPDM250 1-PHASE
SPDM300 1-PHASE
DRX250 3-PHASE
DRX300 3-PHASE
DRX400 3-PHASE
DRX600 3-PHASE

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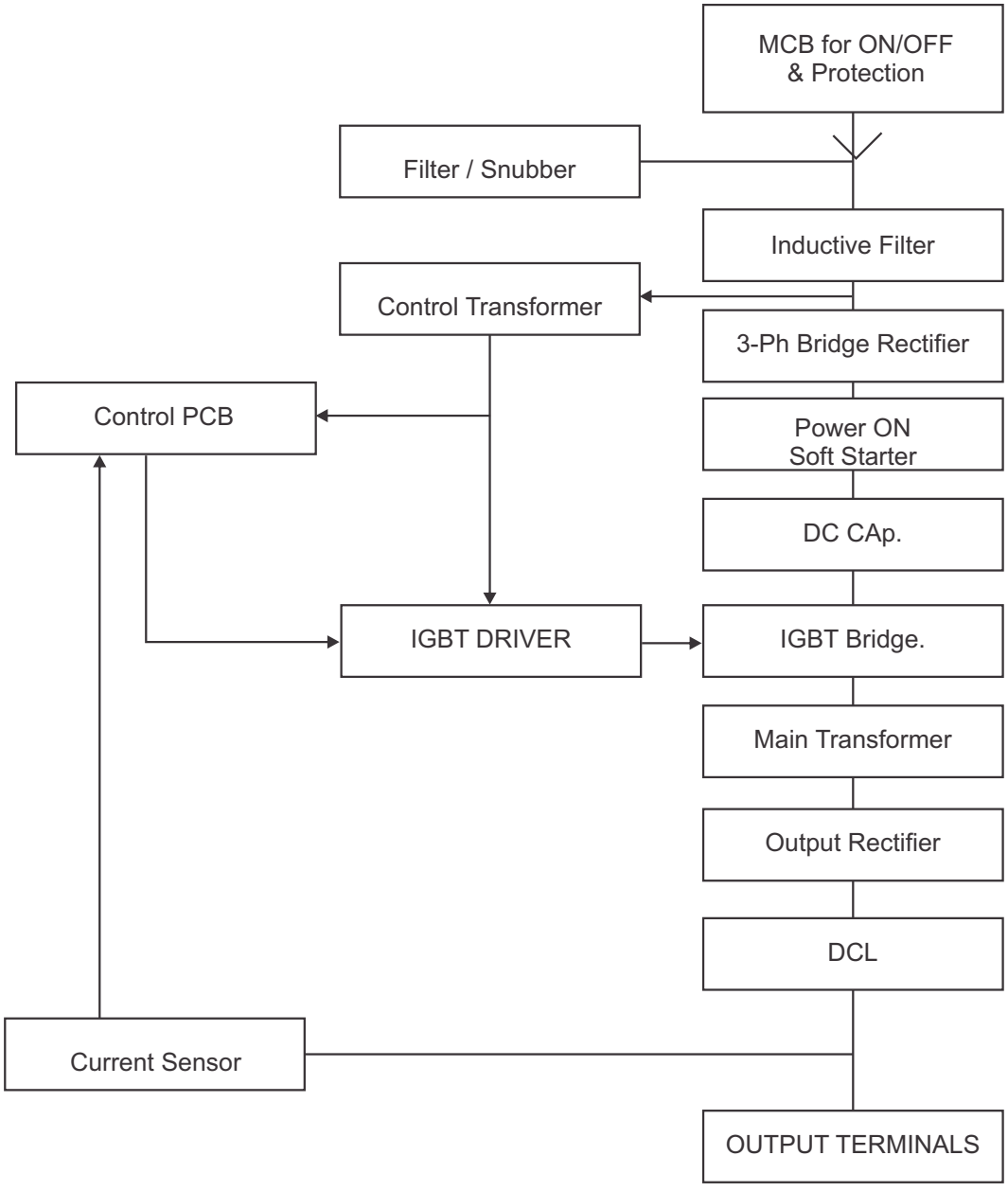
INDEX

THEORY

DRX series welding machines are based on inverter technology by which the 50/60 Hz input supply is first converted to DC by rectifier, then filtered by capacitors for ripple free pure DC volts, then this DC volts are inverted to medium frequency (20KHz) AC, then this high volts are step down to suitable welding volts by small efficient transformer, then re-converted to DC volts and a Inductor is added to smooth spatter free welding.

A MODEL BLOCK DIAGRAM OF POWER SOURCE OF MACHINE



ABOUT MIG:

MIG (Metal Inert Gas) welding, also sometimes called GMAW (gas metal arc welding), is a welding process that was originally developed back in the 1940's. MIG welding is a semi automatic process in which a relatively thin wire is feed through welding gun instead of using a flux coated electrode. The wire fed continuously by a wire feeder from a coil and a shielding gas is used as an alternate of flux, this mechanism gives continuous non stop weld and many advantages comparing electrode welding. Originally Argon was used for shielding the weld pool. This inert gas acts as a shield, keeping air borne contaminants away from the weld zone. Due to high cost of Argon, the weld process was modified by replacing Argon with CO2, because this is active gas some amount of Mn and Si was added to welding wire for cancelling the poor effect of CO2 on weld pool. Today ‘s MIG wire is actually MAG(metal active gas) wire. So, the name MIG/MAG welding be famous.

ADVANTAGE OF MIG:

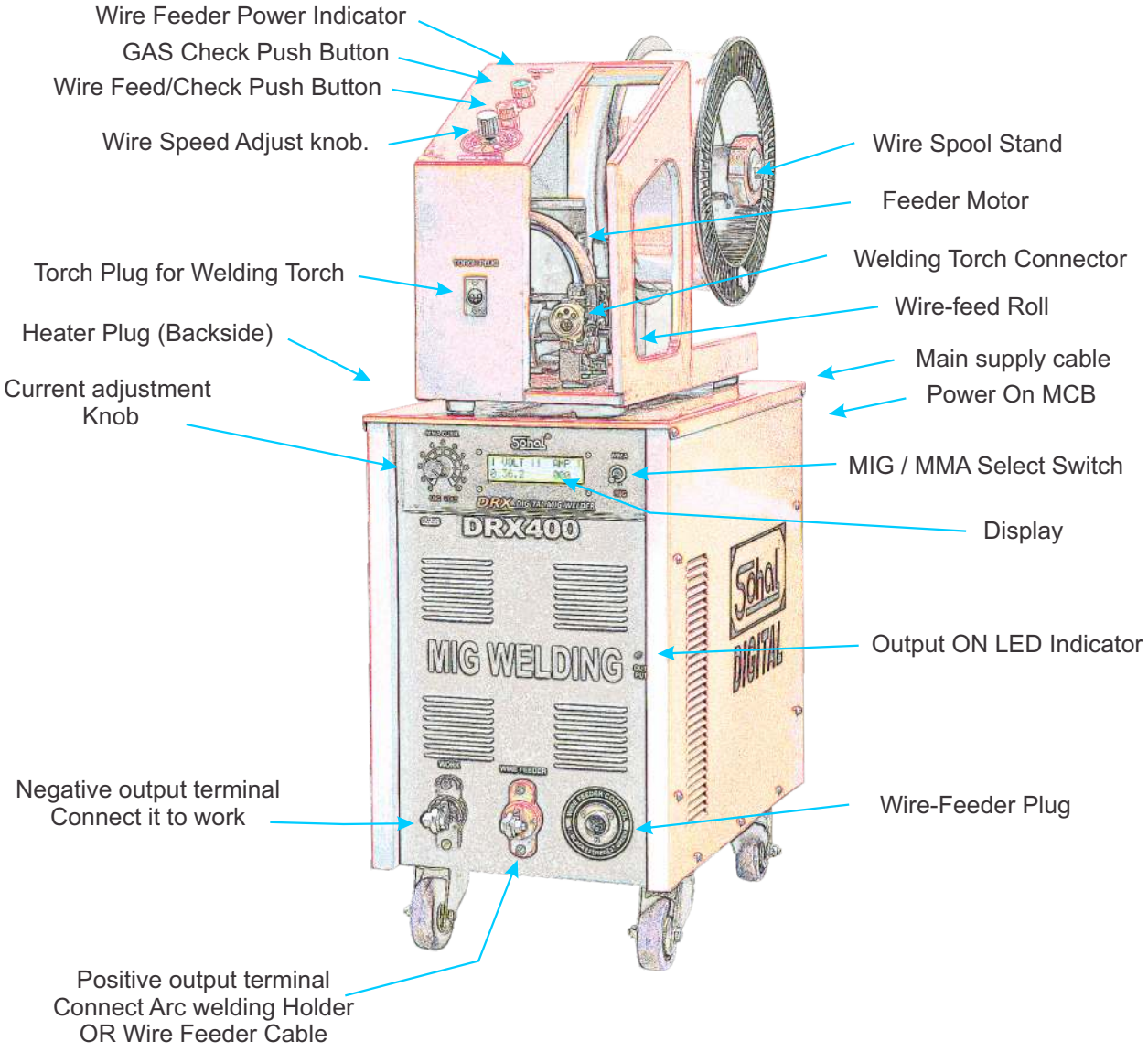
The primary advantage of MIG welding is that it allows metal to be welded much quicker, slag free and continuous than traditional welding "stick welding" techniques. Some major advantages of MIG are listed below:

* It produces long continuous welds.
* Welds much faster, 3 to 5 times faster.
* No slag formed during welding.
* No need to chip or brush welding.
* Clean weld with very little spatter.
* Easy machinable softer welds.
* No burn out at bead corners.
* Great metal filling speed.
* **Ideal for thin metal welding**.
* Good finish.

ADVANTAGE OF INVERTER MIG:

Inverter technology machine consume less power than old technology diode and thyristor base machines. These are small in size ,light weight and does not require power factor controller because their PF never lag below 0.93. In DRX series the embedded system controlled LCD display in front of machine shows preset Volts and live amperes and other useful information.

Quick kow-how :



MODEL: DRX

Quick kow-how :

MIG POWER SOURCE:

1. Main's Supply Cable: Main supply cable is 3-Phase and 1-Earth 4-Wire cable. Connect cable to mains electric supply through required safety switch like RCCB/MCB.

2. Power On Mcb: This MCB is fit at backside of machine for Power On/OFF and trip in case of overload and short-circuit in machine.

3. MIG/MMA Select Switch: This is selector switch to select welding mode the selected mode will be displayed on LCD display. It also disconnect the wire-feeder supply when MMA mode selected.

4. Display: This is alpha-pneumaric LCD display. During mig mode it shows mig volt set by adjacent potentiometer and live ampere during welding. When not welding the ampere reading is 000. In second row left most character shows 0 OR 1, 0 means no weld command from wire feeder and 1 means torch switch is pressed and welding command is received from wire-fedder.
   In MMA mode it display's set welding current.
   And these messages are common in both modes. + 12 volt fails, - 12 volt fails, sensor overload, Machine stop IGBT faulty.

5. Current Adjustment Knob: Rotate knob to set the parameter of selected mode. The change will be displayed on LCD display.

6. Negative Out-put Terminal: Connect one end work cable here and other with metal working table or job.

7. Positive Out-put Terminal: In MMA mode connect welding holder cable and during Mig mode connect wire-feeder welding cable here.

8. Wire-feeder Plug: Connect 3-Pin plug that is permanently joined with a 3-core supply cable to wire feeder.

9. Out-put LED: Glows permanently in MMA mode and glows during weld in Mig mode.

10 Heater Plug: Attach Heater-regulator-flowmeter to Shielding gas cylinder. When Shielding gas is CO_2 connect heater plug here. Heater is necessary to avoid freezing of CO_2 in Pressure regulator. Freezing blocks gas flow and results in gray burned welding.

Quick kow-how :

WIRE FEEDER:

1. Power Indicator: It is placed in front of wire feeder shows the power is on from power source and control cord to wire feeder has been connected. When MMA/MIG selector switch is on MMA mode it cuts wire-feeder 24-Volt supply and power indicator will not glow.

2. Gas Check: Press Gas check push button to check the flow of shielding gas on conical nozzle and scaling on flow meter.

3. Wire Check: Press Wire check push button to check the motor rotation and for feeding wire in torch when you change an empty wire roll with new one.

4. Wire Speed: This is knob to set a wire feed speed according to welding volts and for control of welding current, To run motor fast or want to increase in welding current rotate it clock wise and vice-versa. The rotating device below knob is called potentiometer.

5. Torch Plug: This is base plug(wire-feeder side) for the plug that is attached with torch, make the connections by connecting these plugs. This joins the torch trigger to wire-feeder. When you press torch trigger the trigger switch works through this plug if this plug is not connected the torch switching will not work. The torch trigger(switch) do three functions, It switch on Gas Valve, Feeder-motor and enable output of power-source.

6. Feeder Motor: This is variable speed motor attached with a feed roll and gearbox. It feeds wire at a constant speed set from wire speed knob.

7. Wire-feed Roll: It feeds the Mig wire. It has two V-groves 0.8mm and 1.2 mm. Select according to thickness of Mig Wire.

8. Central Adaptor : It's the connector to connect welding torch, Mig wire and welding current runs through this connector.

9. Wire Spool Stand: It is for placing Mig wire on Feeder unit. A bolt adjust is given to slightly jam the wire spool to avoid continuously rotating it and wire fall.

Installation Guide:

- Leave at least 6 inches space all-around the machine for proper cooling.
- Connect power supply through MCB or MCCB, never connect through old(used) knife type power on switch
- Be sure machine body is properly grounded, before switching it on.
- Place gas cylinder with proper safety that it can't fall.
- Switch off machine during connecting or removal of output leads.
- Throughly tighten the fasteners of output terminals.

Supply Cable:
4-core 1.5 mm sq. for DRX250
4-core 2.5 mm sq. for DRX300 & DRX400
4-core 6 mm sq. for DRX500 & DRX600

Welding or Work cable:
25 mm sq. for DRX250
35 mm sq. for DRX300
50 mm sq. for DRX400
75 mm sq. for DRX500 & DRX600

Using as Electrode Welding Machine :

- Connect Work lead to working table or job. Keep welding holder away from work connections.
- Switch on mains from Mains switch and from backside MCB.
- Set Mode selector Toggle switch to MMA. The lcd screen shows “WELDING CURR.” in first row and set current in second row.
- Select and clamp desired welding electrode in holder and set welding current according to rod size as mentioned on it’s cartoon.
- Make a trial weld, then modify current setting if needed.
- Machine is ready for welding.

Using as Mig Welding :

- Switch on power input.
- Connect Work lead from -ve terminal to working table or job.
- Connect Wire-feeder welding cable to +ve terminal.
- Connect Wire-feeder plug to its pair mounted on machine.
- Set Mode selector switch to MIG
- Connect shielding gas to wire-feeder from pressure regulator.
- Place Mig wire rolll on wire spool stand.
- Check feed-roll grove size, if differ from wire roll set accordingly and feed out a few inches wire outside euro connector (torch connector).
- Fit the welding torch and torch plug.
- Put the heater plug on backside of machine.
- Switch on mains from Main’s switch and from backside MCB.
- Check the welding mode on LCD screen. It shows | VOLT | | AMP | in first row.
- Open the shielding gas from cylinder, Press Gas check button and adjust the gas flow to 10-litre / minute (Average default setting).
- Set wire speed to middle say at 5. Open the contact tip, Climb-up the pressure lever to put pressure on wire between feed roll and pressure bearing. Press the wire feed button, it will run the motor and wire fed starts, when wire comes out from torch neck place the tip back and conical nozzle.
- Set mig volt to 18.0 and wire speed to 2 no. The machine is ready for trial weld on 1mm sheet.
- Do trial weld, Now the machine is ready to work, Set weld parameters according to you job and start work.
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- Check the gas heater, it should be hot. It’s cut-off temperature is 90 deg C.

Fault finding (MMA MODE):

PROBLEM	CAUSE	SOLUTION
The current adjustment knob does not work in proper way and current display does not follow correctly it's movement.	Knob faulty	Replace with new one
Welding stops automatically with-out no message on display	Loose or damaged connection on output terminals.	Clean terminals by emery paper, replace damaged thimble.
	Welding cable damaged.	Replace cable
	Work lead has not properly connected to job.	Connect work lead properly to job or working table.
Welding stops automatically, display blink and following message on display		
1. Thermostat Cut	Machine is overheated due to working continuously at full or Cooling fan faulty	Wait for 5 minutes to lower the inside temperature, if fan faulty replace it.
2. T. coolant Fail (if Optional pressure switch connected in machine)	Water is not flowing through torch.	Check water valve, pipe bent and no water from source
3. Sensor Overload	DCL, Transformer or PCB 271C faulty	Send machine to Service Center
4. CT overload	Main Transformer faulty or 12-V fan faulty or PCB276 faulty.	Replace Faulty Fan or PCB276. Else send machine to Service Center

Fault finding (MMA MODE):

PROBLEM	CAUSE	SOLUTION
Weld bead has low penetration and narrow width more height than usual.	Welding holder is connected to (-)ve terminal instead of (+)ve terminal.	Correct the holder connection.
Welding arc not smooth and produce sound.	From electric supply one phase is missing	Correct electric supply
Message on screen: Inverter Short Machine Stop	IGBT or Driver PCB faulty.	Replace IGBT Kit.

Fault finding (MIG MODE):

PROBLEM	CAUSE	SOLUTION
The current/volt adjustment knob does not work in proper way and current/volt display does not follow correctly it's movement.	Knob faulty	Replace with new one
Pressing torch switch shows 1 in second row starting but Welding current does not come	Loose or damaged connection on output terminals.	Clean terminals by emery paper, replace damaged thimble.
	Welding cable or torch damaged.	Replace cable / Torch
	Work lead has not properly connected to job.	Connect work lead properly to job or working table.
Welding stops automatically, display blink and following message on display		
1. Thermostat Cut	Machine is overheated due to working continuously at full or Cooling fan faulty	Wait for 5 minutes to lower the inside temperature, if fan faulty replace it.
2. T. coolant Fail (if Optional pressure switch connected for water cooled torch)	Water is not flowing through torch.	Check water valve, pipe bent and no water from source
3. Sensor Overload	DCL, Transformer or PCB 271C faulty	Send machine to Service Center
4. CT overload	Main Transformer faulty or 12-V fan faulty or PCB276 faulty.	Replace Faulty Fan or PCB276. Else send machine to Service Center

Fault finding (MIG MODE):

PROBLEM	CAUSE	SOLUTION
Weld bead has low penetration and narrow width more height than usual.	Wire feeder Welding lead is connected to (-)ve terminal instead of (+)ve terminal.	Put work lead on (-)ve and wire feeder lead on (+)ve
Welding arc not smooth and produce sound.	From electric supply one phase is missing	Correct electric supply
Message on screen: Inverter Short Machine Stop	IGBT or Driver PCB faulty.	Replace IGBT Kit.

Wire Feeder Problems

Problem	Cause	Solutions
Wire feeder's power indicator does not glow or it is not functioning.	One phase of power is missing.	Check power supply status then check supply cable & MCB at back of machine.
	Three core control cable damage.	Replace control cable.
	Mode Selector Switch is on MMA Position.	Set it to MIG
	Mode Switch Faulty	Replace Mode Switch.
	Control Fuse have burned	Change Fuse.
Torch switch does not work, But wire & gas Push buttons on wire feeder are working.	Faulty PCB.	Replace PCB. .
	Dust in torch switch or loose connection of torch plug.	Wash the torch switch with a oil based cleaning agent or replace switch. Replace torch plug.
By pressing torch switch Gas does not come.	Gas cylinder empty or Heater does not heat up or Pressure regulator faulty or gas pipe blocked or faulty solenoid valve.	Check step by step all causes and replace the faulty component.
Wire dose not come.	Wire coil jam or Pressure lever loose or Motor not running.	Grease wire spool or set appropriate pressure on wire by adjusting pressure lever then check motor if faulty replace it else replace PCB.
Current does not come.	When switch pressed 0 in starting of second row of display.	Find breakage area and repair it or replace it with new cable.
	Black wire of control cable beaked.	
	When switch pressed 1 in starting of second row of display.	Output cables loose connection, Torch welding cable damaged or Power Source Faulty.

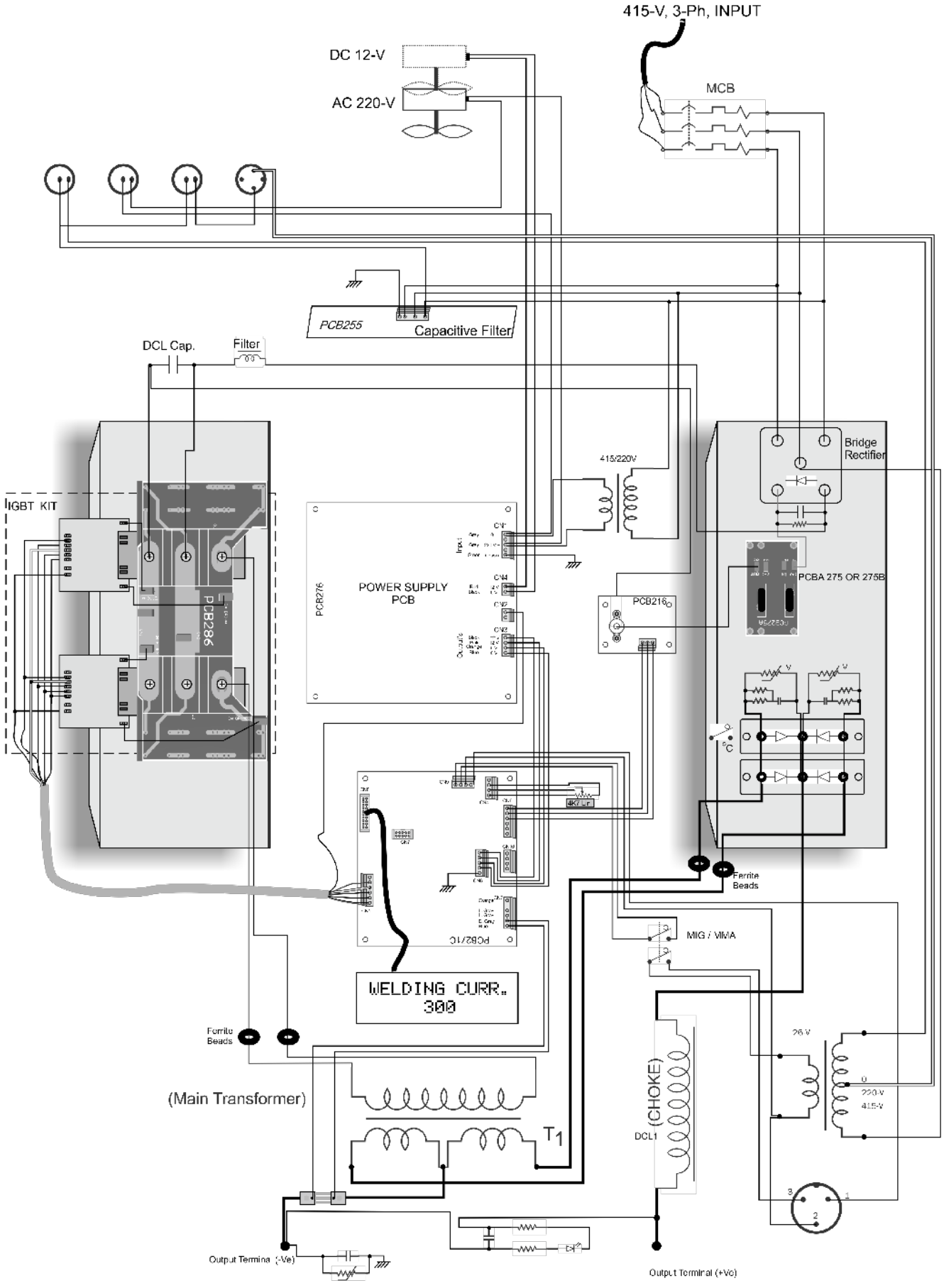
*We provide this information to guide only a certified engineer, There is always risk of electric shock during repair please don't do it your self, always get services from a professional engineer or company.

Cause of Mig Welding defects and their solution's:

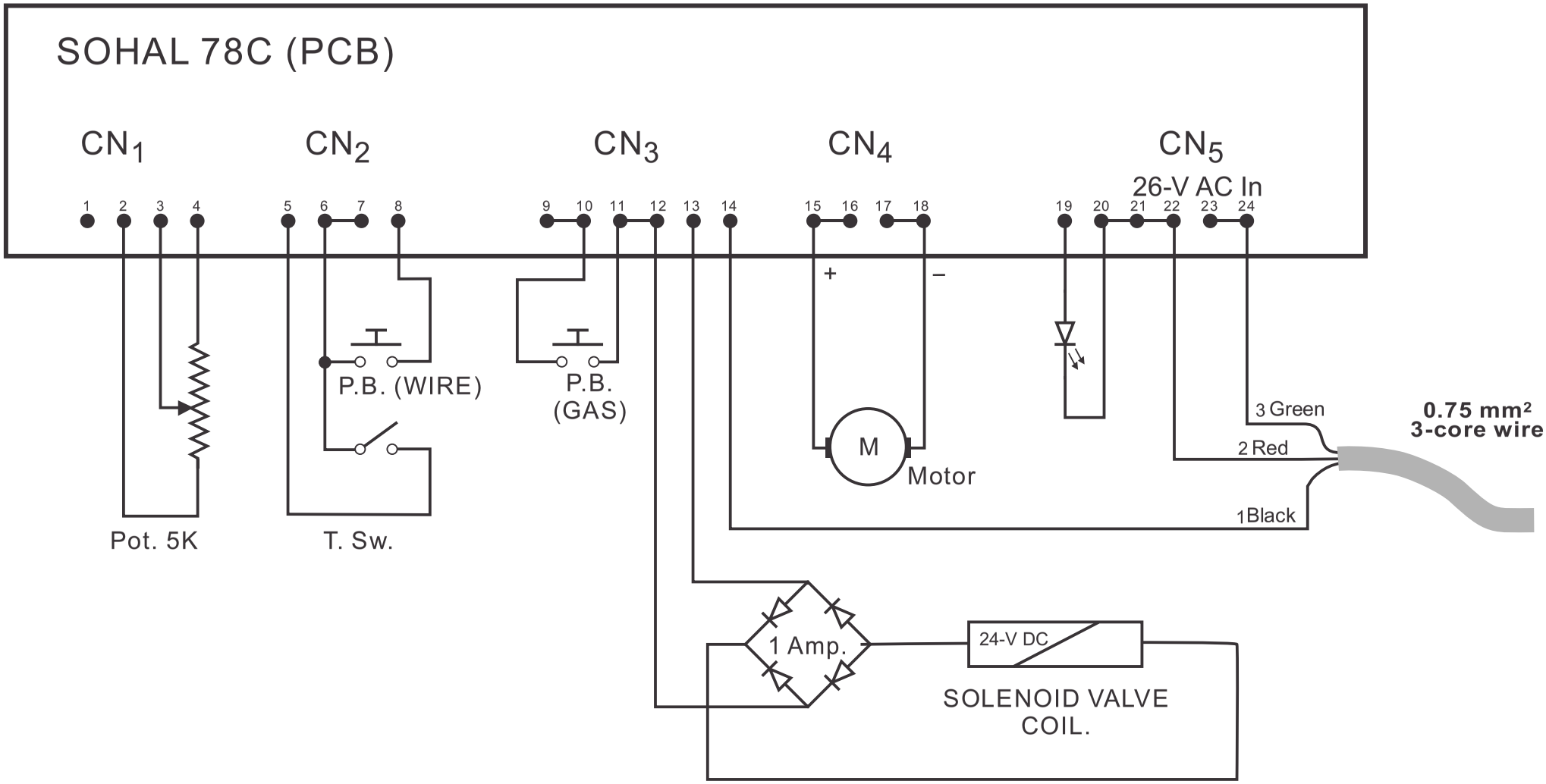
	Welding defect	Cause	Solutions
1.	Black burned welding bead.	Improper shielding gas. Faulty shielding gas.	If gas heater does not heat up replace it or increase gas flow, shield welding area from air flow. Replace gas cylinder with a cylinder from different lot.
2.	Proper color good welding but some fine holes like needle holes in welding.	Poor quality welding wire.	Replace wire with an old lot of wire or change its brand.
3.	Weld bead raise (hollow from inside) in-between or probably at the end of welding.	Dust, oil or cutting oil on job.	Clean the job.
4.	Low penetration.	Wrong selection of shielding gas. Low welding current.	If you are using argon mixed gas, use Co2 shielding gas. Increase welding current.
5.	Thin sheet burns during welding.	Wrong selection of shielding gas. High welding current.	Use Argon mixed gas instead of Co2. Set the welding current to a relative lower value, if it is not possible increase the welding speed.

Connection Diagram of DRX Machines

(Apr, 2016)



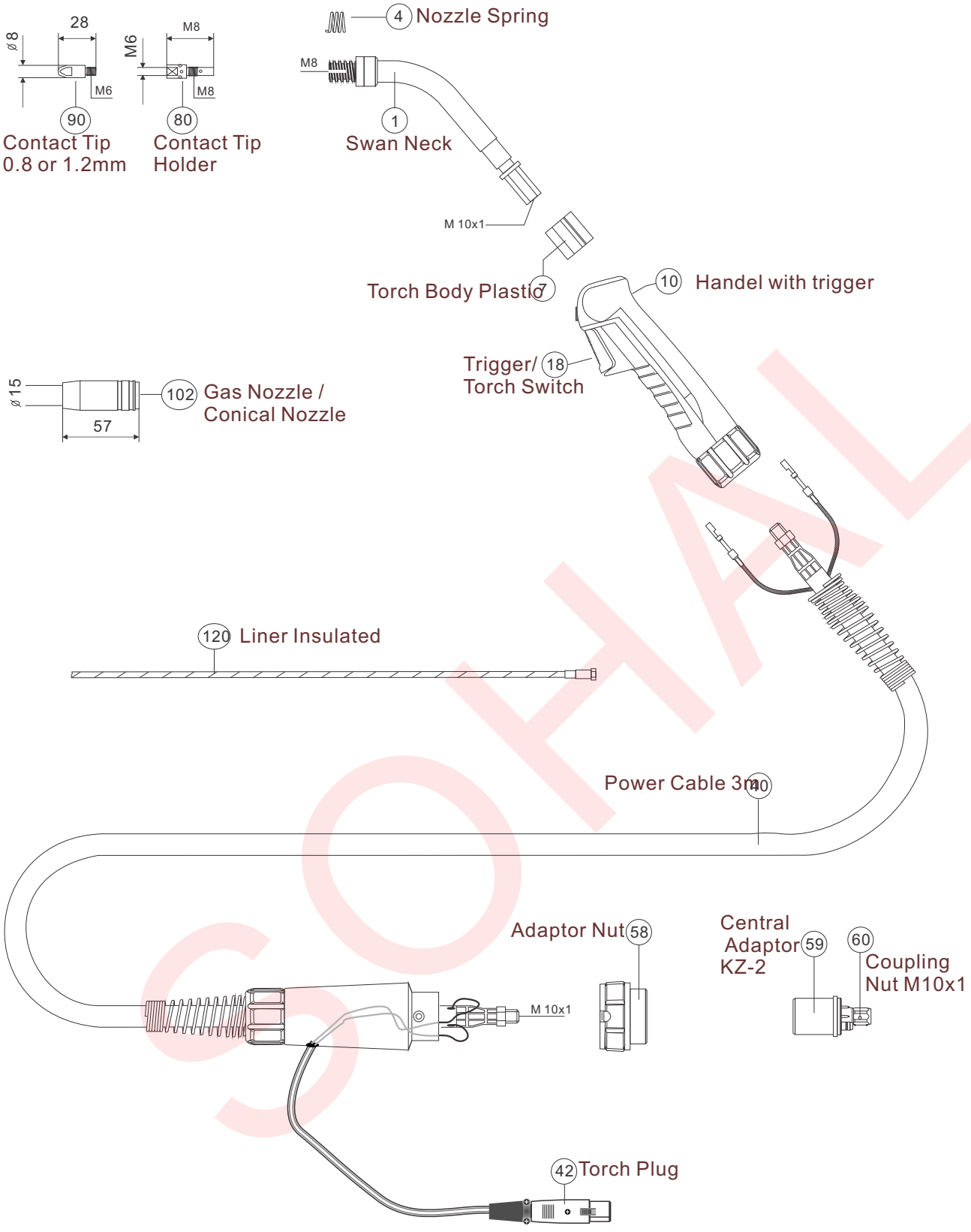
CIRCUIT DIAGRAM OF MIG DRX___ WIRE FEEDER.



UPDATE April 2013

TORCH SPARE GUIDELINEs:

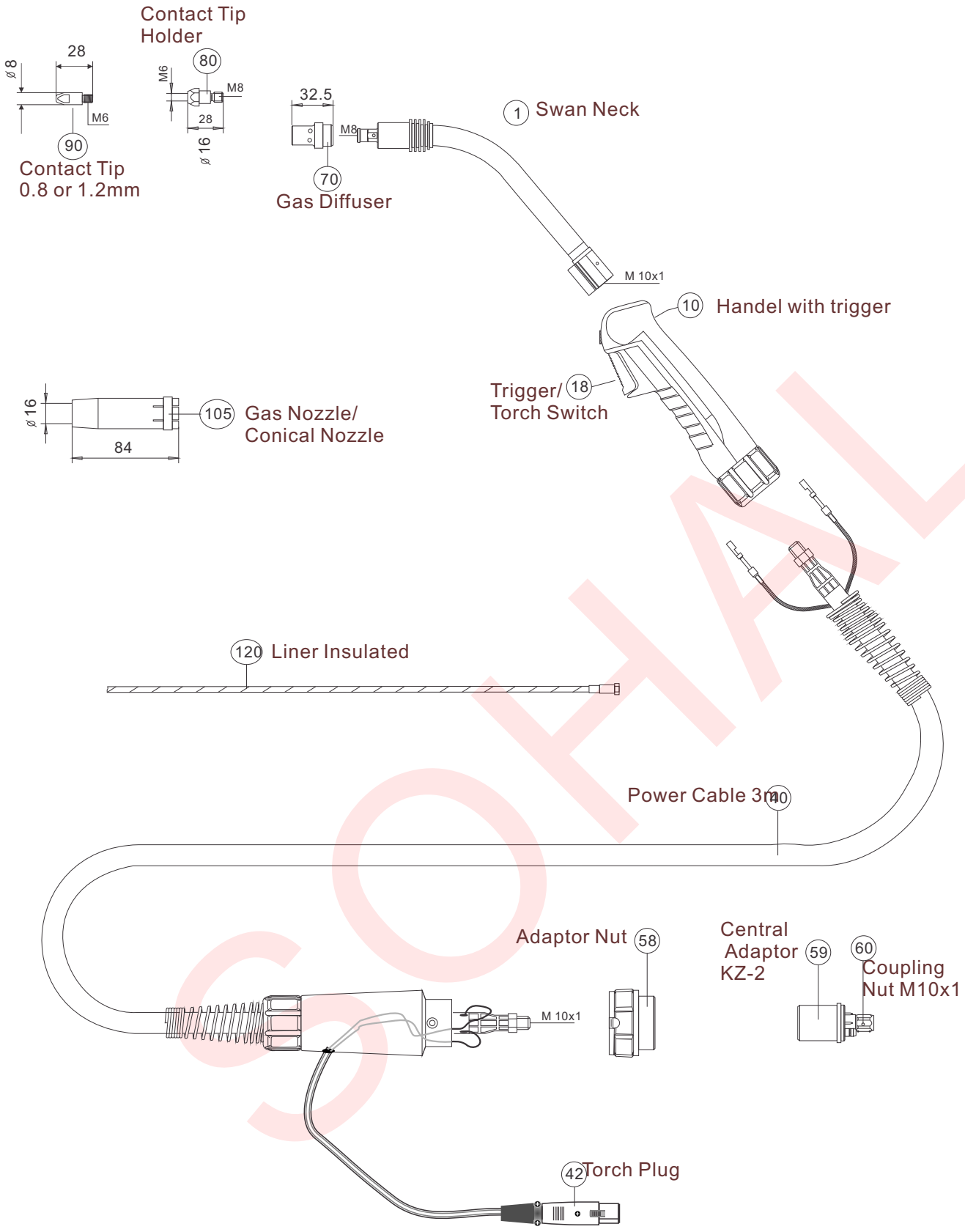
MIG TORCH SOHAL AK25



April 2013

TORCH SPARE GUIDELINEs:

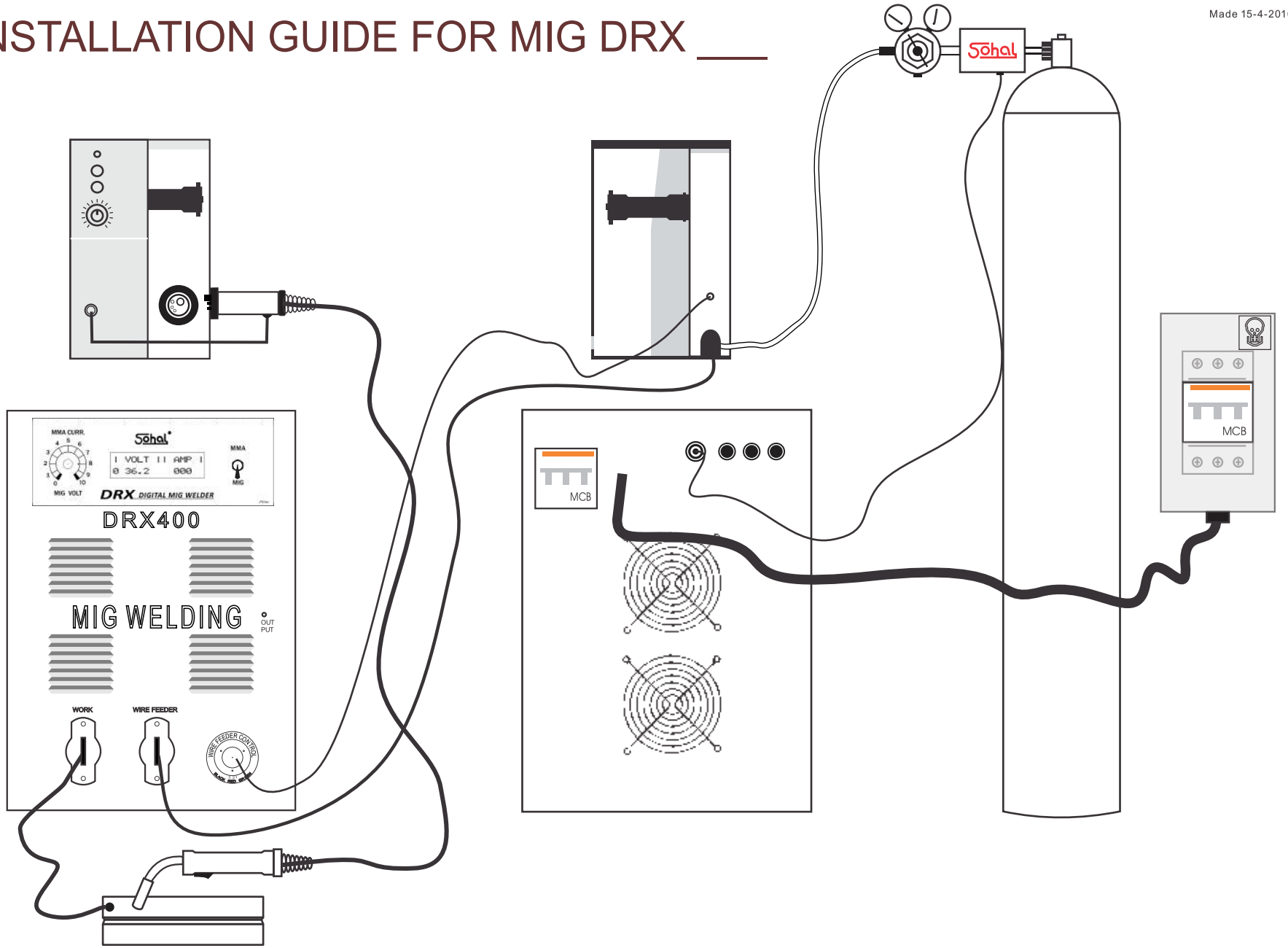
MIG TORCH SOHAL 36KD



April 2013

INSTALLATION GUIDE FOR MIG DRX ___

Made 15-4-2016



TECHNICAL INFORMATION:

Power Source:

ITEM	UNIT	DRX250	DRX300	DRX400
Supply	Volts	415	415	415
Phase	Phase	3	3	3
Freq.	Hz	50/60	50/60	50/60
Rated KVA	KVA	8	9.5	15.5
Power Factor	Lag	0.93	0.93	0.93
OCV	Volts	65	70	70
Output Volts	Volts	16-30	16-34	16-38
Output Ampere	Ampere	50-250	50-300	50-400
MMA Ampere	Ampere	20-250	20-300	20-400
Duty Cycle	%	60	60	60
Cooling	Type	F.A	F.A	F.A
Insulation Class	Class	H	H	H
IP Rating	IP	21	21	21
Dimensions	LxWxH (in)	22x12.5x22	22x12.5x22	22x12.5x22
Weight	Kg	34	40.5	44.5

Wire Feeder:

Fuses	Control Tr.	2.5 Amp
	Fan	1 Amp
	Heater	1 Amp
	PCB 78C	5 Amp.
Feeder Motor		24V DC
Solenoid Valve		24V DC
Wire Speed DRX250/300		3 to 22 m/min
Wire Speed DRX400/500/600		3 to 18 m/min

Heater 220V AC 150W

* NOTE : The information provided above may different from actual.

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Mfrs:

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