DRIC – 2W
[HART]

Communication Unit

SUMMARY

So to use this product safely and correctly, fully understand the manual and keep it for reference.

- Installation and operation manual must be provided to the end user.
- Installation and operation manual is subject to change without prior notice for quality improvement.
- This manual should not be altered without manufacturer's approval for any purpose.
- You must follow the instructions in the manual for safety, the manufacturer is not responsible for problems caused by user carelessness.
- The manufacturer does not have any resposnsibility to the accident arised by user's intentional or negligent fault. (any alteration, disassemble)
  If A/S or modification of the product is required, please feel free to contact us.
- Unless specifically stated, warranty period is one year in principle after the product is shipped.
- Even during the warranty period, in case of any problems caused by the following reasons, please note that it will be charged.
  - Users improperly maintain and / or repair products.
  - Improper transportation, storage or handling of the product beyond the its conditions.
  - The breakdown caused by using the product beyond the specification range.
  - Problems caused by natural disasters such as fire, earthquake, storm, flood, thunder, lightning, and etc.
- During installation and operation, be sure to use the products in compliance with safety regulations of the site.
- When you open the cover of the product, be sure to shut off the power and should work after one minute waiting.

SAFETY INSTRUCTION

This product's installation, maintenance should be performed by a qualified technician following proper safety regulations and standard. Improper installation, usage and maintenance may cause defects or malfunctions. Therefore, to prevent any possible danger, we highly recommned that you are aware of the warning and cautions regarding safety in this manual.

Warning, Caution and Note regarding Safety

Definitions about Warning, Caution and Note in this manual are as followings.

⦿ Warning
- In which human and product damage may occur due to faulty usage or installation.

⦿ Caution
- In which product damage may occur due to faulty usage or installation.

⦿ Note
- In which wrong measurement value is predicted due to faulty usage or installation.

PRECAUTION FOR INSTALLATION

WARNING

Human and product damage may occur due to faulty usage or installation.

- Please be aware of all contents of this manual before you install and operate this radar level transmitter.
- Please do NOT disassemble or modify at user's discretion, which may harm product's perfomance. In these case of modification or disassemble, the product's performance can't be guaranteed and you may also have human or physical, property damage.
- Please do NOT disassemble the product when the power is supplied. When disassembled, the product can't maintain its performance. Therefore Explosion and fire may caused and you may have human or physical, property damage.
- Please start installation and wiring of the Controller(Converter), 1 minute after shutting down power supply. Installation and wiring when power is on and supplied, explosion and fire may caused, so you may have human or physical, property damage due to possible abnormal operation.
- Please do NOT connect power with wet hands but do after checking power is firmly shut. Otherwise, you may have human, property and product damage due to electric shock.
- Please do NOT give too much pressure or strength to the product.
- Please do NOT give shock when moving the product. Damage due to the shock may cause malfunction of the product, then the product can't be operating properly.
- Do not apply anun-prescribed usage to the product. Otherwise blackout, fire and explosion may occur when the product is used.

PRECAUTION FOR INSTALLATION

CAUTION

Product damage may occur due to faulty usage or installation.

- Please be fully aware of the contents stated in this manual before installation and usage.
- This product uses cables with sheld when wiring. (Sheild cable " 2C x 24AWG " recommended) To suppress outter noise not to interfere with the product's proper operation, and to prevent inner noise leakage into out, communication cable with shield must be used and properly grounded.
- When you install the product, you need to check whether if the mounting specification suits its application.

NOTE

Wrong measurement value is predicted due to faulty usage or installation.

- Please be reminded of the polarity of the product.
- Please check the symbols around the wiring terminals and then proceed with wiring.

GENERAL SPECIFICATIONS

Wiring Method : 2 – wires
(Shield cable 2C x 24AWG)

Compatible Sensors : DC 24V P.L.C type

Power Source : AC 110~220V, 50~60Hz

Power Consumption : 3W

Max. Connection Length : 1.1KM (1100M)

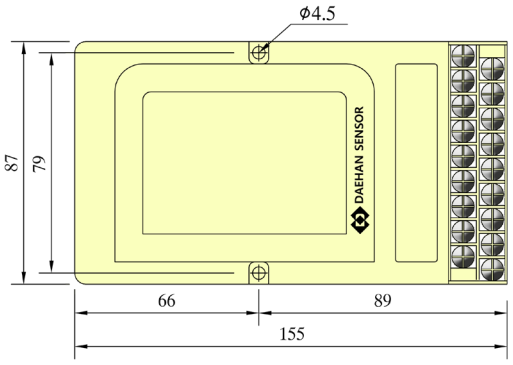
Display : L.C.D (4x3)

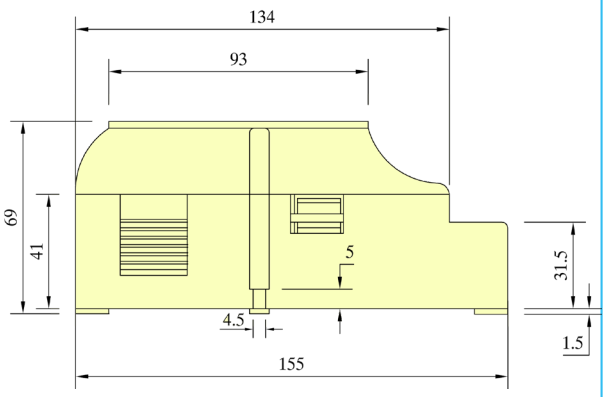
Output Signal : DC 4~20mA(HART)

Operating Temperature : −20℃ ~ 60℃

Dimensions : 87mm(W) x 155mm(H)
69mm(D)

Material : A.B.S





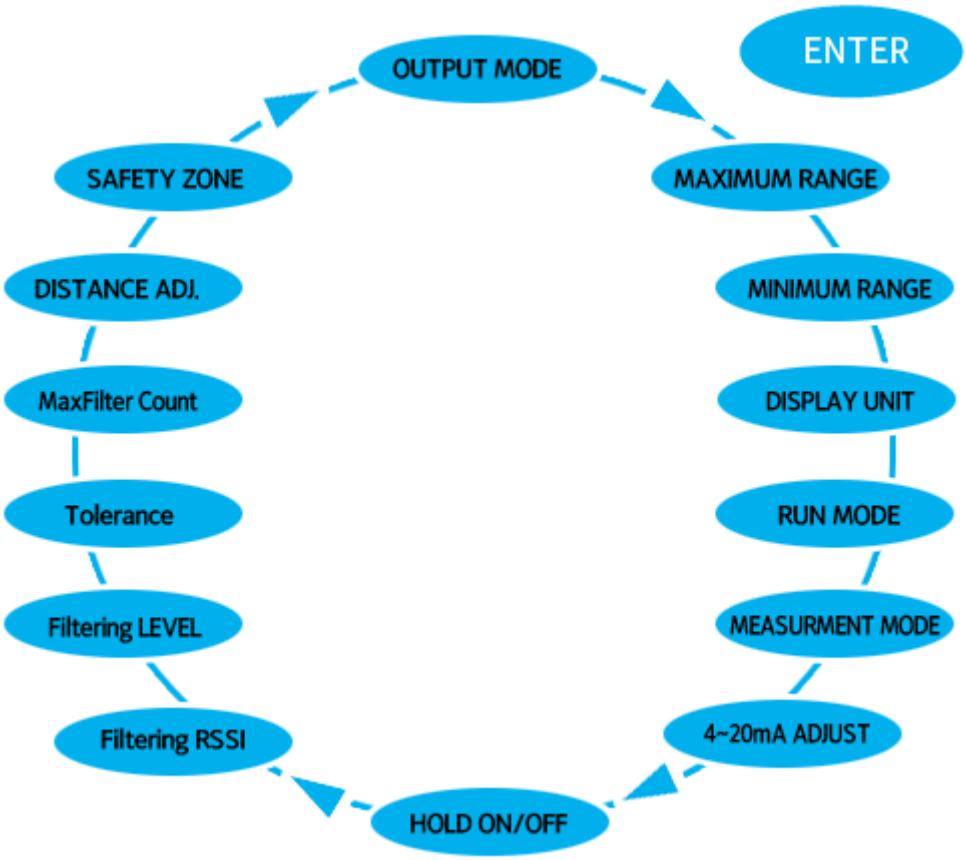
DRIC−2W is a power supplier as well as a bidirectional digital communication converter using Hart technology, to be used with DR & DU series level transmitters as a pair.

Not only capable of indicating the connected transmitter's measurement status, but also DRIC−2W fully configures the transmitter's settings and make the device function in any Hart network.

SETTING MENU GUIDE

You may press ENTER KEY for over 2 seconds during pressing MODE KEY, to enter the setting menu.

Interface applied model : DRIC-2W [HART]



Once you get in the setting menu, you'll be able to move to other tabs by pressing ENTER KEY. Then the display will lead you to the next tab in clockwise as above picture.

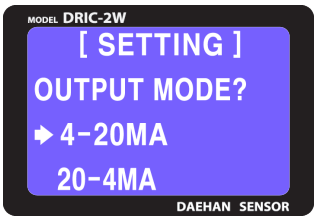
Once you get in any tabs, you can change the indicated values with UP/DOWN KEYS. The values change faster if you keep pressing UP/DOWN KEYS while also pressing MODE KEY. After changing or checking the values, you may press ENTER KEY for over 2 seconds, to completely get out of the setting menu.

All the changed values in the setting menu will be automatically saved when you get out.

SETTING MENU GUIDE

OUTPUT MODE

You can choose output signal type as below.

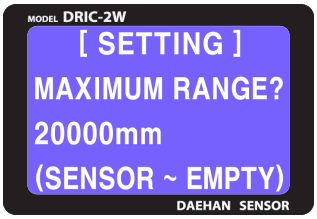


4~20mA – When the tank is empty, the device transmits 4mA. When the tank is full, it transmits 20mA.

20~4mA – When the tank is empty, the device transmits 20mA. When the tank is full, it transmits 4mA.

MAXIMUM RANGE

Set the distance from the sensor's beaming end to the bottom of the tank, when the tank is supposed to be empty.



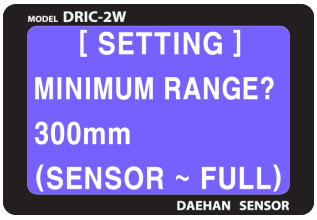
CAUTION

The Max. distance capability varies depending on which level transmitter you're using and you can't set for higher value than the model's capability.

When the medium's measured height exceeds the designated range by this setting, you will see "Out of Range Error", even if the height is still in the hardware's capability.

MINIMUM RANGE

Set the distance from the sensor's beaming end to the surface of the fluid, when the tank is regarded as full.



CAUTION

User's setting value (The Range between the Max Range and Min Range) should be at least equal to the Dead Band of the transmitter or bigger than the Dead Band.

When the medium's measured height exceeds the designated range by this setting, you will see "Out of Range Error", even if the height is still in the hardware's capability.

SETTING MENU GUIDE

DISPLAY UNIT

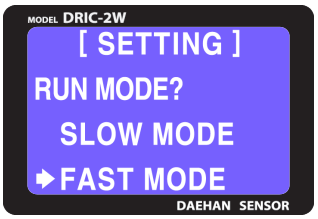
This tab is to set in which measure the level is indicated on LCD. Either Centimeter(cm) or Inch(in) is selectable. (Default = cm)

CAUTION

Regardless of the user's choice here, the level's measure for the communication is fixed as mm(Milimeter).

RUN MODE

The indicated level value is an average value measured within a certain period of time. This is for increasing the sensing accuracy. But inevitably, the accuracy decreases when the actual level abruptly changes. So as to acquire a more adaptable sensing value, users can choose either Slow mode (to update at every 9 second) or Fast mode(to update at every 3 second). (Default = Fast)

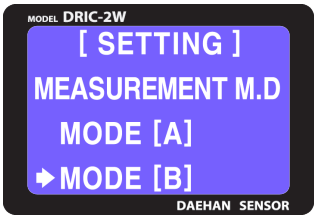


CAUTION

Fast mode doesn't go through the hunting filtering process and regards the reaction speed as top priority. So the sensor may fail to acquire a correct value from time to time. Fast mode, thus, is more suitable for field applications with drastic level changes.

MEASUREMENT M.D

You can set whether if the measured distance value includes the deadband or not. (Default = MODE B)



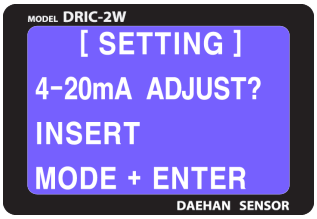
MODE A – The indicated level (0~100%) will include the deadband.

MODE B – The indicated level (0~100%) will NOT include the deadband.

SETTING MENU GUIDE

4-20mA ADJUST

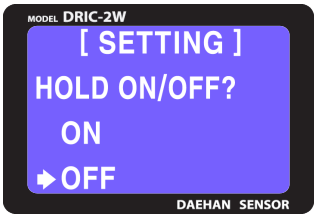
A user can adjust the output current.



CAUTION

Do NOT use this function without a properly calibrated current metering device.

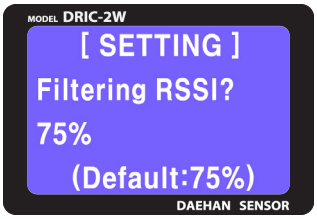
HOLD ON/OFF



When this configuration is set to be ON, the device fixes the output value at the last correctly measured value, in case the sensor faces with an temporary error. But as soon as the sensor retrieves its normal sensing status, the output will also be updated with a correct level value being measured at the moment.

On : Fixing the output at the last correctly measured value. (the last emitted value)
Off : The sensor will emit a selected current output under SAFETY ZONE menu.

Filtering RSSI



This is to set the sensor's minimum sensitivity.
By adjusting the senxsing signal's sensitivity, mis-operations can be prevented. However, if the filtering level is set too high, even normal signals may not properly be received.

This value can be set upto 100% Max.
(If you want to turn off this function, please set to 0%)
(Default = 75%)

SETTING MENU GUIDE

Filtering Level

This menu is to filter the output.

You can choose whether to apply a digital filtering process or not to the sensor's output. Once you turn this funtion on, you'll be able to adjust the tolerance in this filtering process via the tolerance menu followed by this description. (Default = On)

On – Turning on the filtering process and activating the tolerance menu.
Off – Turning off the filtering process and inactivating the tolerance menu.

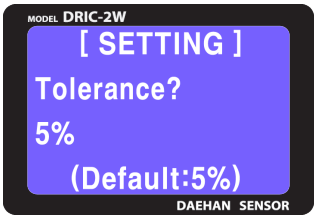
Tolerance & Max. Filter Count

Ahead of the explanation on details, "Tolerance" performs 2 functions here. The first function, as a standard for distinguishing whether the observed data is acceptable or not (the 1st. function), while also as a unit with a certain size in the filtering process as the second function (the 2nd. function).

When the digital filter is turned on by the user, the filtering process starts to be activated and apply its functions to the output, in case any observed data exceeds the range which the user set in this tolerance (the 1st. function).
From the moment of the event occurance, the output starts to be fixed at the last value which had been emitted before the event. (We call this fixing the output with the last value in this context, "Hold".) While holding the output, internally the measurement is being processed continuously and the device keeps counting both (A.) the number of times of the measurement and (B.) the user's setting in Maxfilter count, and comparing them. As soon as (A.) becomes the same as (B.), the device, until the held output value gets the same as the currently measured value, starts to add and subtract the adjusting value by as much as the tolerance (the 2nd. function), to every new measurement and accordingly, to the output. When this two values (The value being advance from the hold status and the currently measured value) eventually get close to each other enough to be within the tolerance(the 1st function), the filtering function comes in a standby status and starts to wait for the next event.

SETTING MENU GUIDE

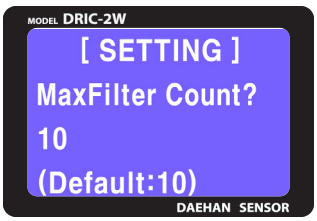
Tolerance



This menu appears only after the filtering process is turned on, as decribed in the filtering level steps.
Here, you can set how much (big) tolerance the digital filtering process will bear, before the sensor proceeds with its output. The output will be gradually increased or decreased in accordance with the designated tolerance.

Upto Max. 20% can be set.
(Default = 5%)

MaxFilter Count



When the Digital Filter is set to be on, You can also set how many times of the measured value of the sensor should be tolerated ("B." in the description) before the digital filter applies its function to the actual output.
If a newly measured value is still out of the tolerance (the 1st. function in the description) even after this count, the digital filter will automatically & gradually apply the filtering values as much as the tolerance to the output, Until the new value and the filtering value becomes close enough to be within the tolerance.

(Default = 10)

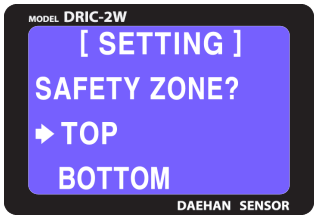
DISTANCE ADJUST

In case any manual correction to the sensor's originally measured value is required, you may apply the correcting distance value here. The changed result will be applied to both the sensor's display and the output.

Upto Max. +−250mm can be applied.
(Default = 0mm)

SETTING MENU GUIDE

Safety Zone



This function comes in active only when the user chooses "OFF" under the HOLD ON/OFF menu.

When the sensor fails to properly measure the level, the device transmits a designated value among below current-output options as an alarm.

TOP - The sensor transmits the value which is assigned for the tank's full status.

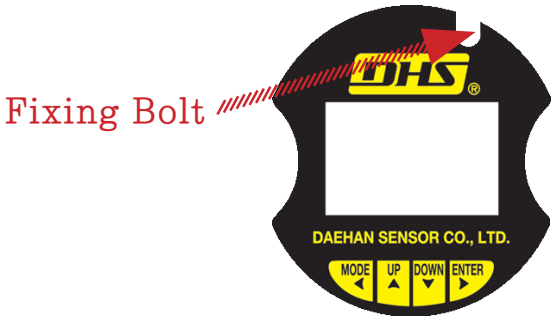
BOTTOM - The sensor transmits the value which is assigned for the tank's empty status.

When "4-20MA" is set under the OUTPUT menu,
TOP = 20mA while BOTTOM = 4mA,

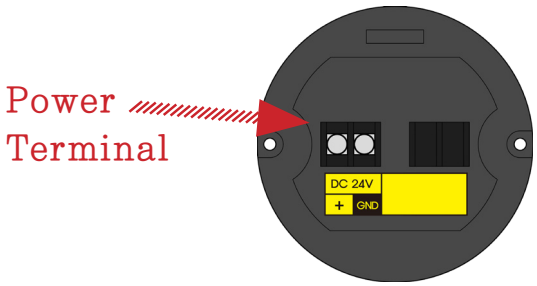
When "20-4MA" is set under the OUTPUT menu,
TOP = 4mA while BOTTOM = 20mA.
(Default = TOP)

If the sensor fails the measurment after repeatedly trying for a certain period of time, the above designated value will be transmitted while LCD will indicate a message meaning a measurement failure. Once the sensor retrieves its normal measurement status and starts to sense again, it will immediately switch the output with the correctly measured distance(level) value. When the sensor is initially power-supplied but before is fully finishing loading its resources to start the measurement, the sensor will transmit the SAFETY ZONE's value.

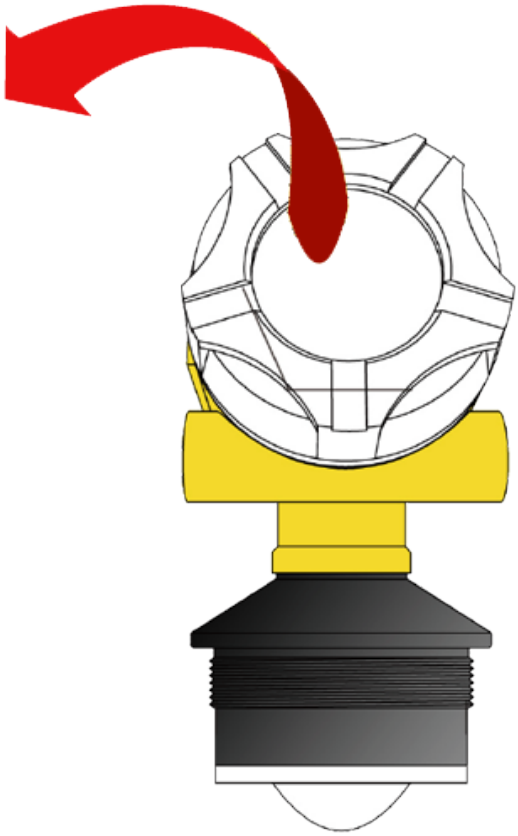
WIRING GUIDE (Sensor Side)



〈Display Unit〉



〈Control Unit〉



Wiring sequence

① Loosen the bolt which fixes the display unit.
② Hold both sides of the display unit and pull up to take the unit apart.
③ Check the control unit's each terminals and proceed the wiring.

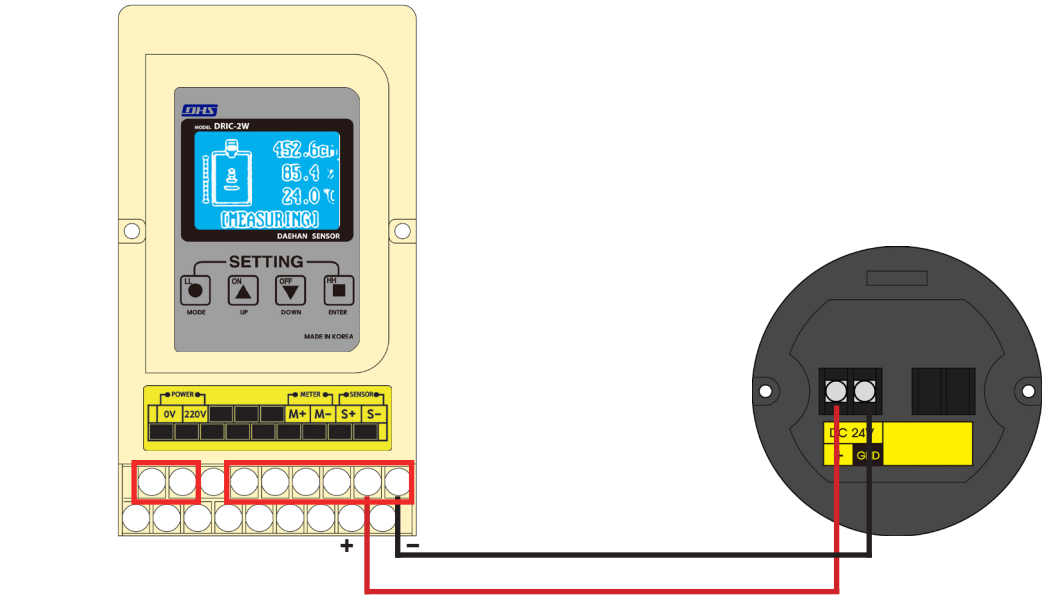
NOTE

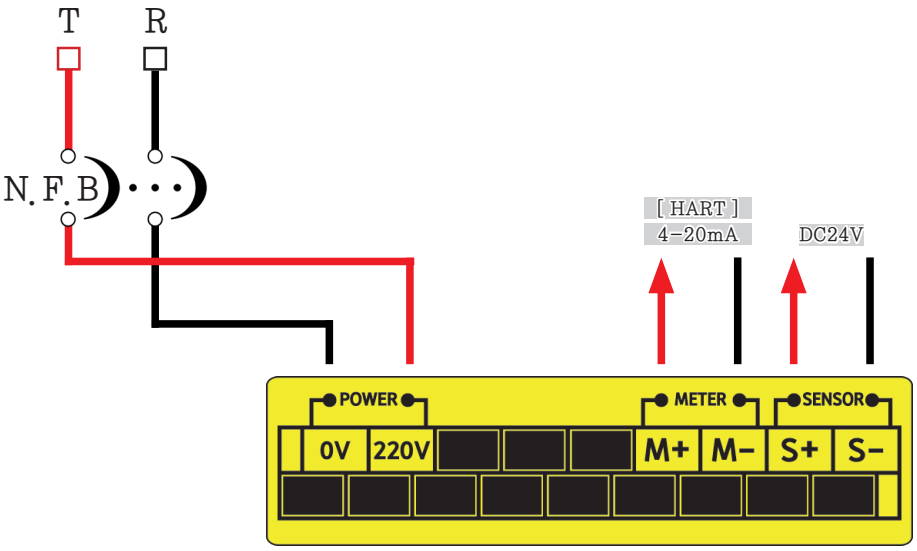
When wiring, please shut off the power, take the display unit apart and then connect to the control unit. After assembling the display unit, turn on the power. Take care NOT to bend pins in the middle of this process.

NOTE

Dissembly / assembly at discretion of sensor can cause malfunction. In the case of defects caused by a discreational alteration, all reponsibility falls on the end users, and it may void manufacturer's warranty.

WIRING GUIDE (Unit Side)





Wiring Map