S.P.I **DEVELOPMENTS Ltd**
(SPECIAL PURPOSE INSTRUMENTS)

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GLUE LINE SENSOR

GLS2SYSM

For

FILTER MAKING MACHINES

PRODUCT MANUAL

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7.0 MAINTENANCE

Shift Maintenance Schedule

The following schedule should be followed at the beginning of, and half way through, each shift. Refer to drawing Page 7-1.

7-1 Brush any loose paper dust or carbon from the sensor face and pins

7-2 Clean any Glue deposits from the sensor face and surrounding area including air block and pins.

7-3 Check that the air flow from the cleaning block is strong enough to keep dust from collecting on the sensor face and guide pins. Adjust air flow using the adjustment screw.

7-4 Check the GLS output:_

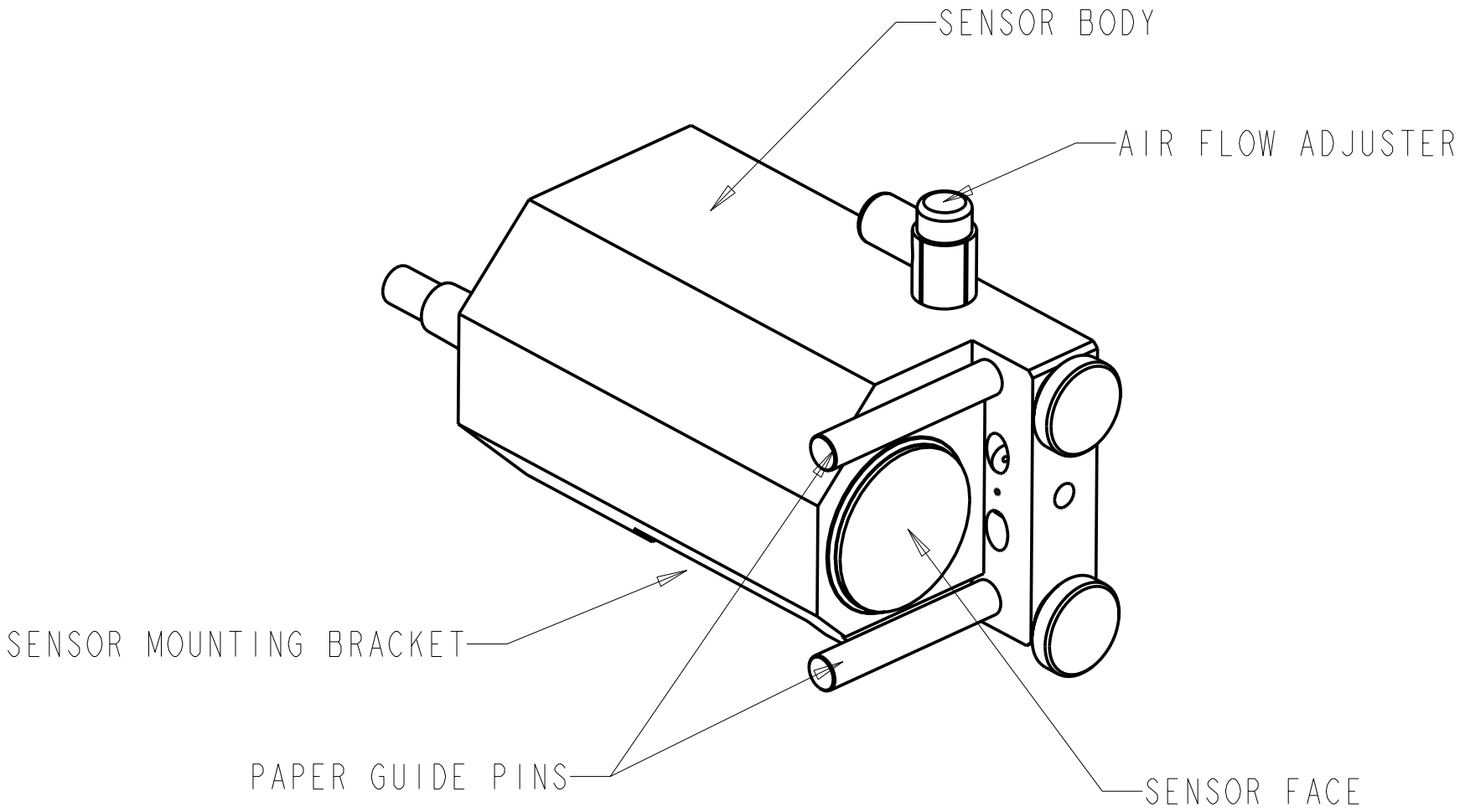
i. Place a finger over the sensor face and check the display output; if should read 900 to 1023 or the message "Sensor Missing".

ii. Remove the paper well away from the guide pins, ensuring that nothing is in close proximity of the sensor face.

iii. Check the display output should read 10 to 150 value.

iv. If value is higher Clean the face and surrounding area.

REMOVE ALL SHARP EDGES & BURRS



ISSUE	REVISION DESCRIPTION	DATE	INIT
1	AS DRAWN		
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UNLESS OTHERWISE STATED
ALL DIMENSIONS IN MM
SURFACE FINISH 1.6 R.A. MAX
TOLERANCES
NO DECIMAL PLACES ± 0.25
ONE DECIMAL PLACE ± 0.1
TWO DECIMAL PLACES ± 0.05
WHOLE ANGLES DEG ± 1
WITH MINUTES ± 15 MIN
◎ CONCENTRICITY WITHIN 0.05

3rd ANGLE

MATERIAL | QTY
TREATMENT

TITLE
GLS-2 SENSOR MAINTENANCE

DRAWN P.D.L	DATE 16/02/05	SCALE 1:1
PART No GLS2200-MAINTENANCE		REV No 1

6.0 RUNNING THE SYSTEM

SETTING THE TOLERANCE (continued)

Only the customer can determine what is the correct tolerance setting should be, to ensure only good product is allowed through the machine and all bad product is ejected.

If the customer's QC department do not have any figures on what are the maximum & minimum settings of glue for the particular product being run then the following procedure needs to be implemented:-

To establish the minimum amount of adhesive that will give an acceptable bond

1) Establish that the current pump settings produce a product that is acceptable by QC

2) Reduce the flow from the pump by 0.5 gram/100 Mtrs in steps and take product samples from each setting.

3) QC to check samples, and advise what level of pump flow, is the product outside the specification.

4) Run Machine at full speed and lower pump flow to the value advised by QC.

5) Gradually reduce tolerance setting until the alarm & eject is activated. This tolerance value will then represent the correct minimum setting of adhesive that would be allowed for a good product.

6) Re-set the pump flow to the original settings

6.0 RUNNING THE SYSTEM

STARTING FOR THE FIRST TIME

6-1 Set both High & Low tolerance MODE to off
6-2 Start the machine and run at full speed applying glue.
6-3 Check that the start signal message on the run screen say's ON
6-4 Switch the key switch ON and press "T" teach button.
6-7 Check the glue lines or swirl and establish that they are correct to specification. If they are not, make the necessary adjustments to the pump flow or applicator to correct them.

6-8 When the machine is running at full speed and the glue lines are correct press "T" teach button and the controller will store the current value of glue.

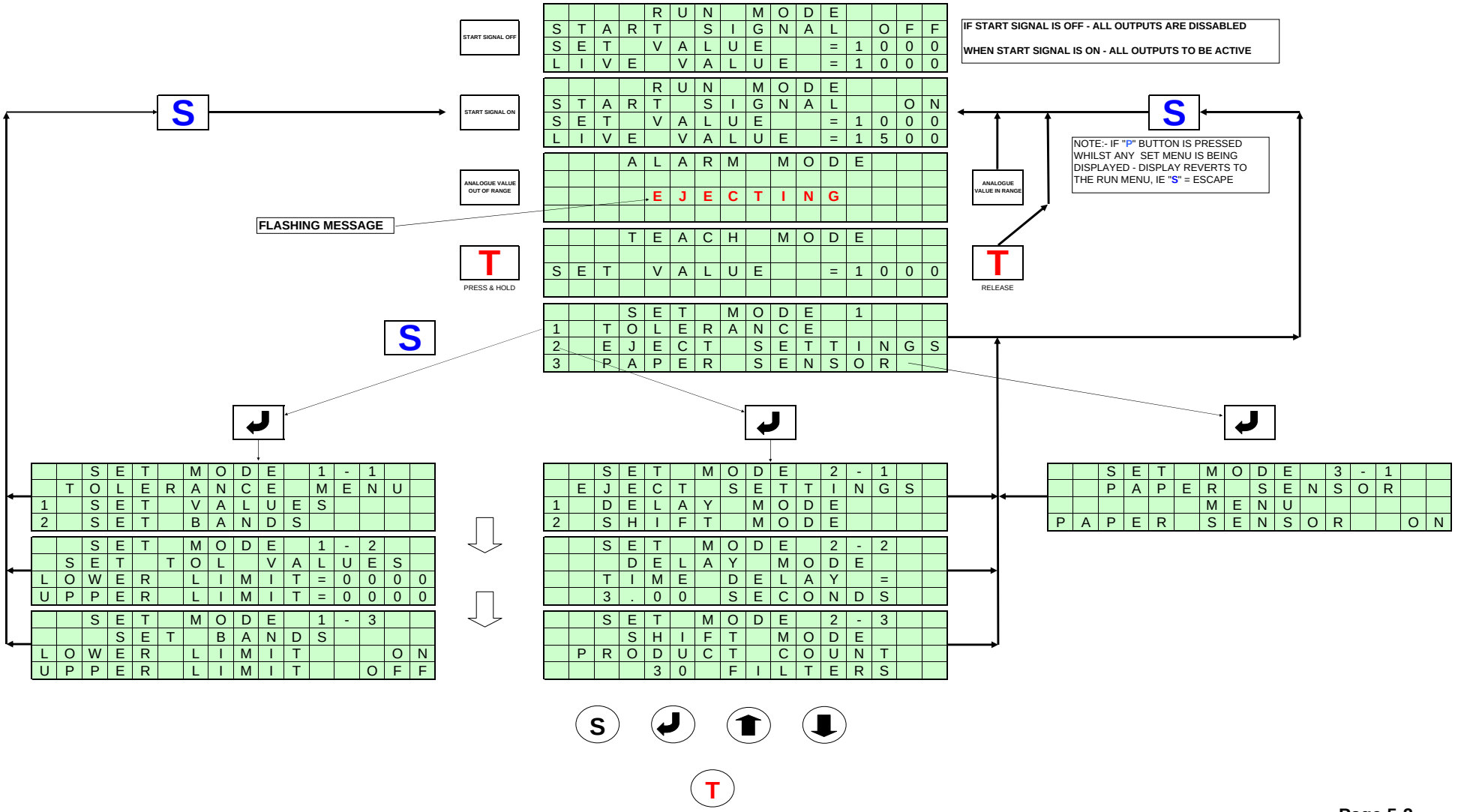
6-9 Set tolerance % to desired values.
6-10 Set Tolerance MODE to required settings.
6-11 The system will now monitor the glue application and eject any product that is outside the tolerance band.

To simply check that the system is monitoring the glue quantity, momentarily stop or remove one glue line, the alarm should sound and the product ejected.

See page 6-2 for further advice on setting the tolerance

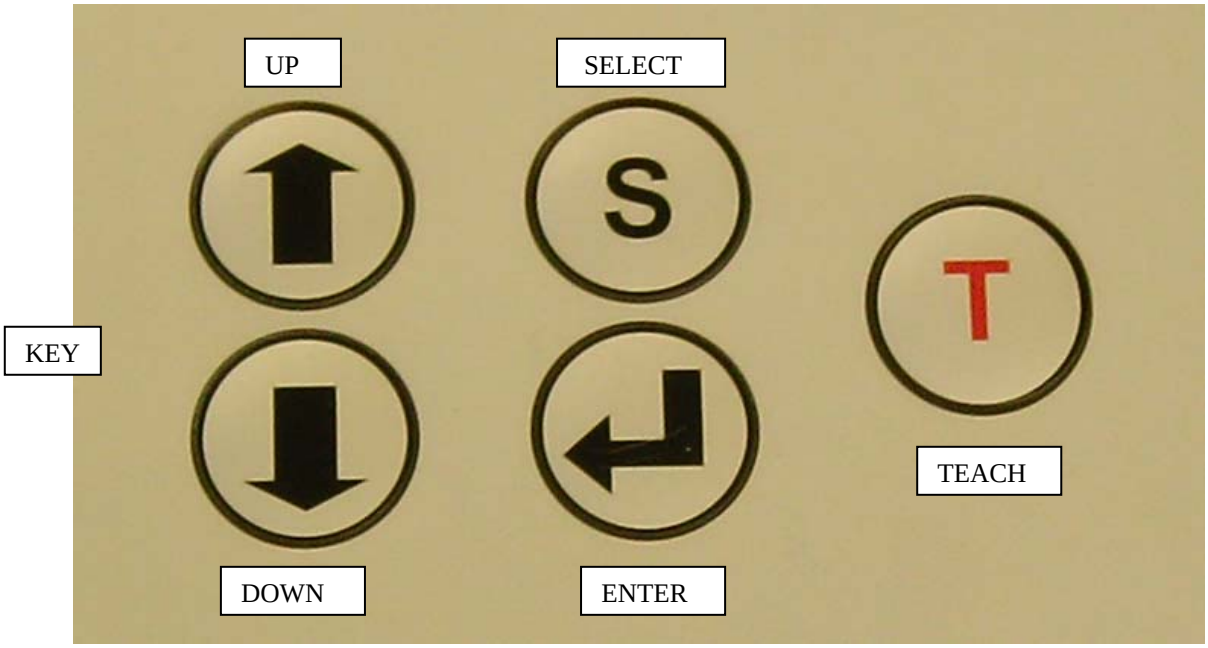
5.0 HOW TO CHANGE DATA

GLS-2 SCREEN ALGORITHM



5.0 OPERATING INSTRUCTIONS

BUTTON FUNCTIONS



5-1 TEACH – To store the current value measured by the detector in Memory.

5-2 ENTER – To accept the change in value or choice of option.

5-3 SELECT – Press To enter setting mode.

5-4 Key switch – In vertical / removed position, inhibits all Button actions, ie no changes can be made. With the key switch in the angled position (on) allows all buttons to be used.

4.0 POST INSTALLATION SYSTEM CHECKS

4-1 Switch on power to the Machine Interface Termination module

The screen should display the “RUN MODE” menu, as below:-

				R	U	N		M	O	D	E			
S	T	A	R	T		S	I	G	N	A	L		O	F	F
S	E	T		V	A	L	U	E			=	x	x	x	x
L	I	V	E		V	A	L	U	E		=	x	x	x	x

4-2 If the screen does not illuminate or display any screens, check the following:-

4-3 Check that 24vdc is on terminals 1 & 2 on the Machine Interface Module.

4-4 If 24vdc is not present – investigate.mains power is on terminals 2 & 3 in the termination box.

4-5 Place your hand directly over the sensor front face and check that the “Live Value” Number rises above 500

4-6 Remove your hand and check that the number drops back to approx 50.

4-7 Press the “**T**” teach button, the SET Value & the Live value should now read the same.

3.0 INSTALLATION – ELECTRICAL CONNECTIONS

Refer to page 3-1

POWER CONNECTIONS

24vdc Power connection
3-1 Connect 24vdc supply to terminals 1 & 2

Alternatively 110 or 240vdc can be used
Connect ac supply to PSU Input L – N - E

START SIGNAL CONNECTIONS

The Glue Start signal input will accept voltage levels from 12 – 24vdc, this signal is required to tell the sensor when glue is being applied to the paper, this signal should be taken from the Machine control circuit and should only be ACTIVE HIGH when the machine is running AND Glue is being applied.

3-2 Connect above start signal to terminal 10 and its 0v ref to terminal 6

Alternative a 110 or 240vac Start signal can be used solenoid that is responsible for switching on the glue applicator that is applying the glue to be checked by the sensor (for filters this would normally be the internal anchorage applicator)

If above start signal voltages are to be used connect to terminals RL-1 A1 & A2 and fit appropriate voltage relay in RLY-1 socket.

XENON CONNECTIONS

Using the 2 core cable supplied

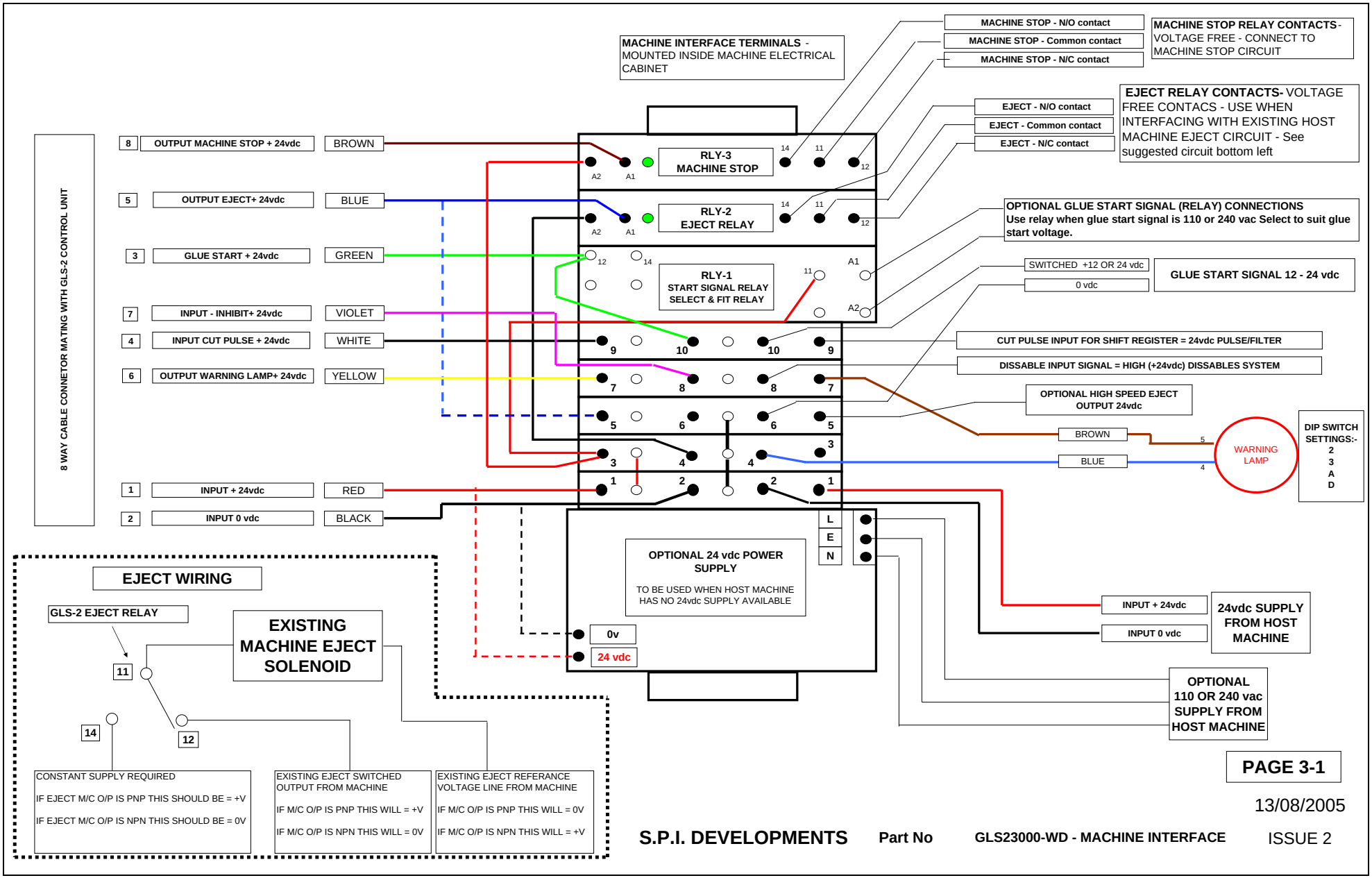
3-3 Connect brown wire to terminal 7 & to Xenon terminal 5
3-4 Connect blue wire to terminal 4 to Xenon terminal 4

EJECT SOLENOID CONNECTIONS

3-5 Connect existing machine Eject solenoid as recommended on Page 3-1

MACHINE STOP CONNECTIONS

3-6 Connect machine stop relay to machine stop circuit


MACHINE INTERFACE TERMINALS - MOUNTED INSIDE MACHINE ELECTRICAL CABINET
MACHINE STOP - N/O contact
MACHINE STOP - Common contact
MACHINE STOP - N/C contact
MACHINE STOP RELAY CONTACTS - VOLTAGE FREE - CONNECT TO MACHINE STOP CIRCUIT
EJECT - N/O contact
EJECT - Common contact
EJECT - N/C contact
EJECT RELAY CONTACTS- VOLTAGE FREE CONTACS - USE WHEN INTERFACING WITH EXISTING HOST MACHINE EJECT CIRCUIT - See suggested circuit bottom left
8 WAY CABLE CONNETOR MATING WITH GLS-2 CONTROL UNIT
8 OUTPUT MACHINE STOP + 24vdc BROWN
5 OUTPUT EJECT+ 24vdc BLUE
3 GLUE START + 24vdc GREEN
7 INPUT - INHIBIT+ 24vdc VIOLET
4 INPUT CUT PULSE + 24vdc WHITE
6 OUTPUT WARNING LAMP+ 24vdc YELLOW
1 INPUT + 24vdc RED
2 INPUT 0 vdc BLACK
RLY-3 MACHINE STOP
RLY-2 EJECT RELAY
RLY-1 START SIGNAL RELAY SELECT & FIT RELAY
OPTIONAL GLUE START SIGNAL (RELAY) CONNECTIONS
Use relay when glue start signal is 110 or 240 vac Select to suit glue start voltage.
SWITCHED +12 OR 24 vdc
0 vdc
GLUE START SIGNAL 12 - 24 vdc
CUT PULSE INPUT FOR SHIFT REGISTER = 24vdc PULSE/FILTER
DISSABLE INPUT SIGNAL = HIGH (+24vdc) DISSABLES SYSTEM
OPTIONAL HIGH SPEED EJECT OUTPUT 24vdc
BROWN
BLUE
WARNING LAMP
DIP SWITCH SETTINGS:- 2 3 A D
L
E
N
OPTIONAL 24 vdc POWER SUPPLY
TO BE USED WHEN HOST MACHINE HAS NO 24vdc SUPPLY AVAILABLE
0v
24 vdc
INPUT + 24vdc
INPUT 0 vdc
24vdc SUPPLY FROM HOST MACHINE
OPTIONAL 110 OR 240 vac SUPPLY FROM HOST MACHINE
EJECT WIRING
GLS-2 EJECT RELAY
EXISTING MACHINE EJECT SOLENOID
11
14
12
CONSTANT SUPPLY REQUIRED
IF EJECT M/C O/P IS PNP THIS SHOULD BE = +V
IF EJECT M/C O/P IS NPN THIS SHOULD BE = 0V
EXISTING EJECT SWITCHED OUTPUT FROM MACHINE
IF M/C O/P IS PNP THIS WILL = +V
IF M/C O/P IS NPN THIS WILL = 0V
EXISTING EJECT REFERANCE VOLTAGE LINE FROM MACHINE
IF M/C O/P IS PNP THIS WILL = 0V
IF M/C O/P IS NPN THIS WILL = +V
PAGE 3-1
13/08/2005
S.P.I. DEVELOPMENTS
Part No
GLS23000-WD - MACHINE INTERFACE
ISSUE 2

2.0 INSTALLATION – Optional Paper sensor

If the Optional Paper sensor is to be used proceed as follows:-

2-19 Locate a section of the paper path BEFORE Glue is applied.

2-20 Mount the sensor in the same way as described on Page 2-1

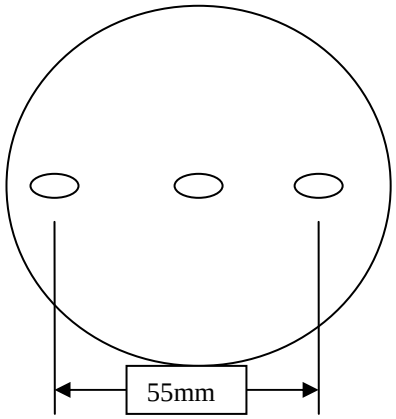
2-21 Plug the sensor cable in the spare socket provided in the bottom of the GLS-2 Controller.

2-22 Clip the cable to the machine bed to ensure it will not get caught or snagged during machine running.

2.0 INSTALLATION – XENON/AWD

The xenon lamp and audible warning device should be mounted in a suitable place on machine where the lamp can be seen by the operator.

2-18 Mark out and drill two holes for mounting the lamp as shown below



2) Drill a 6mm clearance hole in the middle of the two mounting holes for cable.

2.0 INSTALLATION – Machine Interface Module

The Machine Interface Module should be mounted ideally within the machine control cabinet where access is available to the machine wiring and within 3 meters of the GLS-2 control box.

2-14 Drill 2 holes and secure Machine Interface module to machine.

2-15 Connect the cable with plug on end into the GLS-2 controller socket,

2-16 Connect free end of cable to the Interface Module as shown in the wiring diagram on Page 3-1 (this cable can be shortened if required)

2-17 Secure cable to machine with clips.

2.0 INSTALLATION - CONTROLLER

The controller should be mounted in a suitable position on the machine to give easy viewing to the machine operator, and within 2 meters from the sensor.

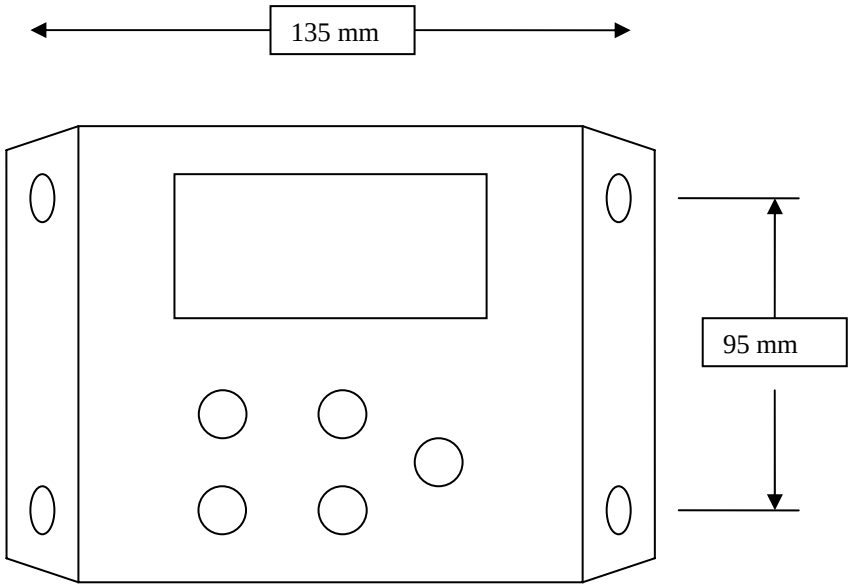
2-9 Find suitable location for controller on machine.

2-10 Mark out and drill & tap 4 off M4 mounting holes. See below

2-11 Secure controller with screws provided.

2-12 Plug in sensor lead to socket on bottom of controller.

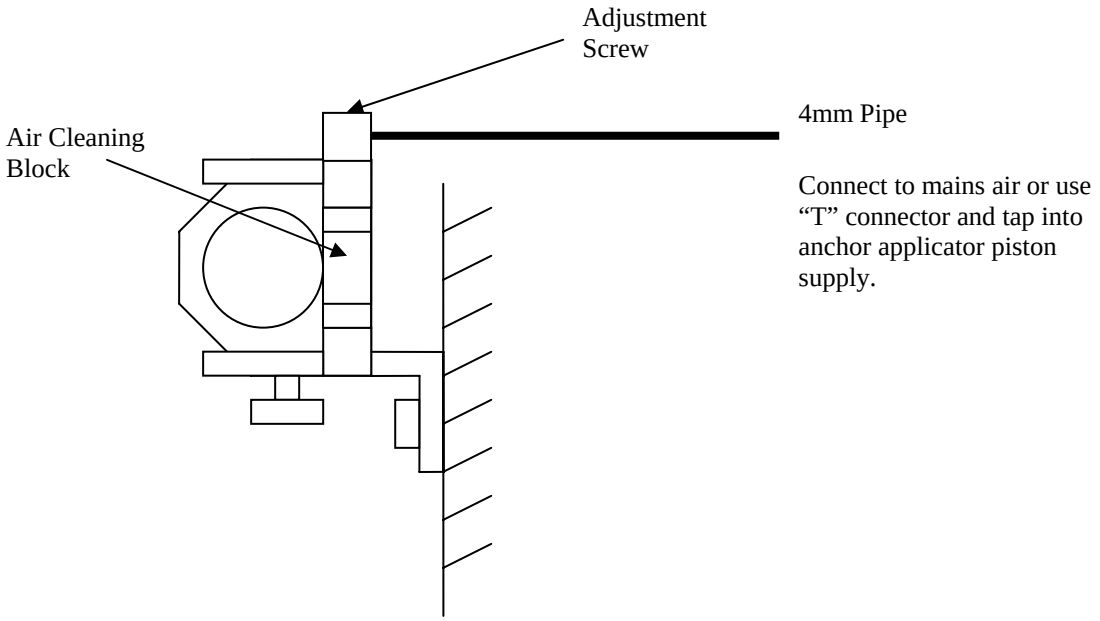
2-13 Secure sensor cable to machine with cable clips.



2.0 INSTALLATION – SENSOR AIR CLEANING BLOCK

An Air cleaning block is fitted to the sensor body. When connected to an air supply, it deters the build up of chalk and carbon dust on the sensor body and paper guide pins, which can affect the performance of the sensor. It can be connected directly to the main air supply for the machine or tapped from the air supply for the anchor line gun.

An adjustment screw allows the flow of air to be altered. It should be set such that the flow of air is just sufficient to stop dust from settling.



2.0 INSTALLATION - SENSOR

The Sensor Assembly should be mounted in a suitable position on the front face of the machine, after the paper has had the glue lines or swirl applied that are to be detected.

2-1 Find a suitable location on the machine front face.

2-2 See page 2-1 for different options for mounting.

2-3 Clean the machine face and mark out the position of the mounting hole as shown on page 2-1.

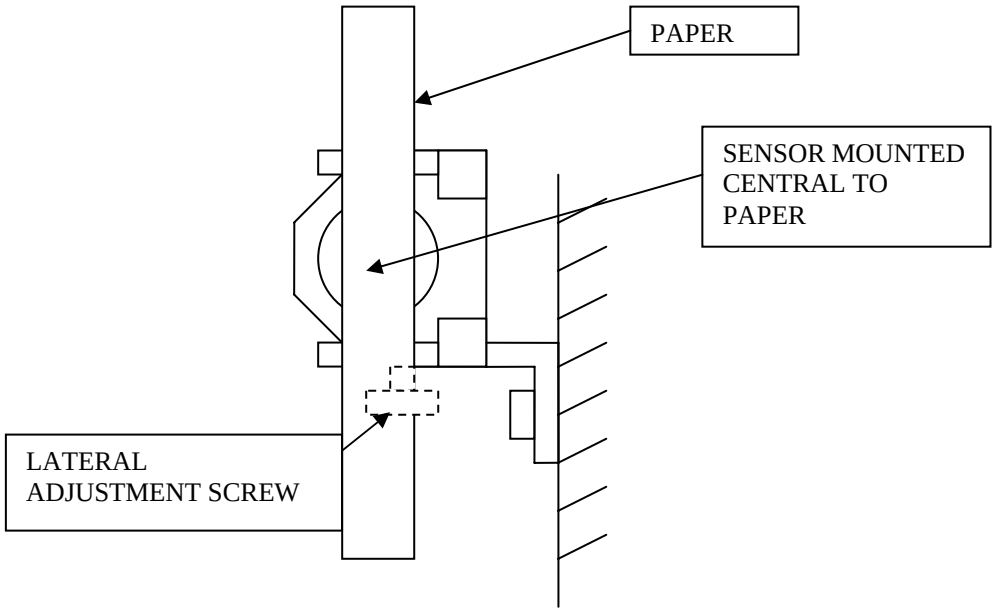
2-4 Drill & tap this hole M6.

2-5 Mount sensor angled bracket to machine face with M6 screw provided and lightly lock in position.

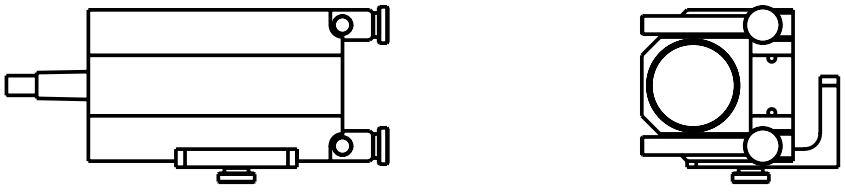
2-6 Place sensor on mounting bracket and check position of sensor to ensure the paper is deflected by a minimum of 2mm, See Page 2-1.

2-7 Fully tighten angled bracket M6 screw

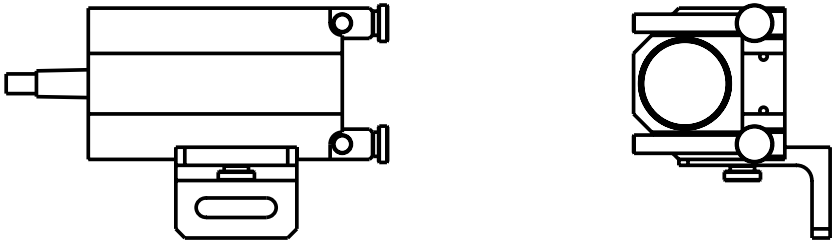
2-8 Place sensor on bracket and set sensor position to be central with paper, then tighten lateral adjustment screw as shown below.



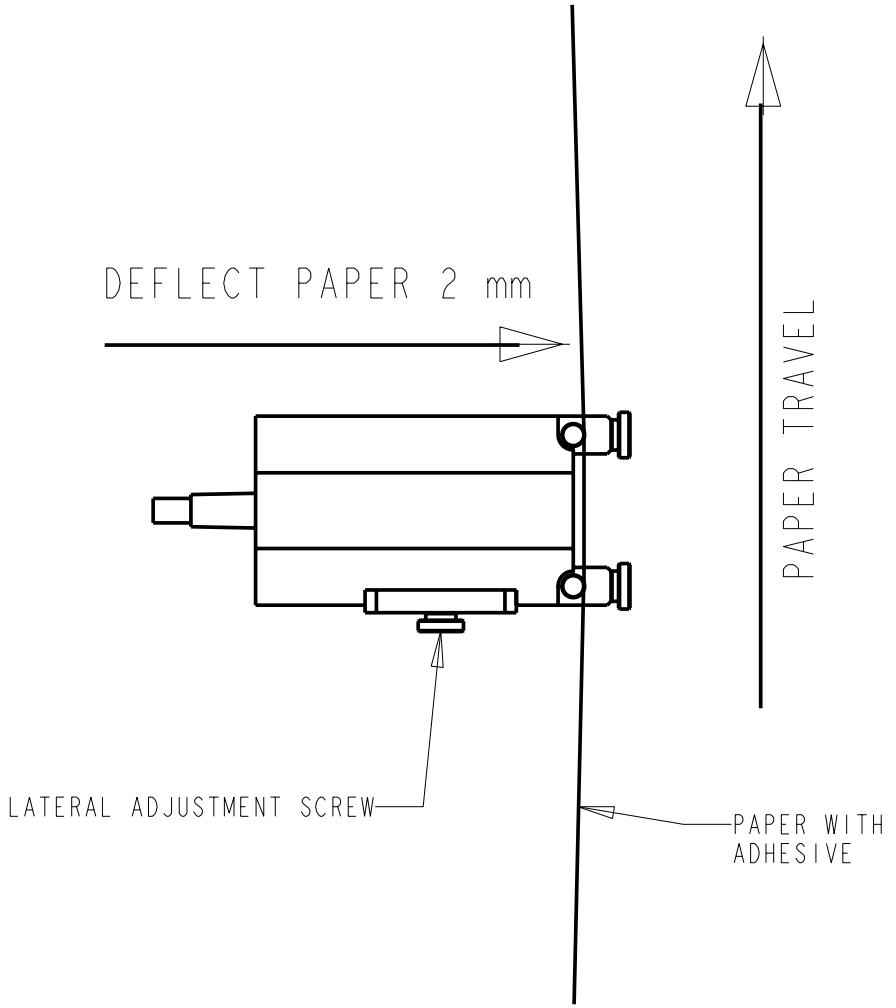
REMOVE ALL SHARP EDGES & BURRS



MOUNTING OPTION "A"



MOUNTING OPTION "B"



ISSUE	REVISION DESCRIPTION	DATE	INIT
1	AS DRAWN		
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ONE DECIMAL PLACE ± 0.1
TWO DECIMAL PLACES ± 0.05
WHOLE ANGLES DEG ± 1
WITH MINUTES ± 15 MIN
◎ CONCENTRICITY WITHIN 0.05

3rd ANGLE

MATERIAL | QTY
TREATMENT

TITLE
GLS1200 SENSOR INSTALLATION

DRAWN P.D.L.	DATE JAN 2004	SCALE 0.5
PART No GLS1200-INST		REV No 1

1.0 SPECIFICATION

SPECIFICATION

INPUTS	MODE	VOLTAGE	AMPS	ACTION
Power		**+24vdc or110-240vac**	**300mA**	
Glue Start Sig 1	**Active High**	**+ 24vdc**	**50mA**	**All Outputs active**
Alt Start Sig	**Active High**	**110 or 240vac**	**Relay coil**	**All Outputs active**
Cut Pulse	**Active High**	**+24vdc**	**50mA**	**Moves shift register 1 bit**
Dissable	**Active high**	**+24vdc**	**50mA**	**Disables outputs**

OUTPUTS	MODE	VOLTAGE	AMPS	ACTION
Eject (RELAY)	**C/O Contacts**	**Voltage free**	**6A/240v**	**Eject Product**
Eject H-Speed	**Active High**	**+ 24vdc**	**100mA**	**High speed eject**
Machine Stop RLY	**C/O Contacts**		**6A/240v**	**Stops machine** 2
Xenon	**Active High**	**+24vdc**	**100mA**	**Sound & Lamp ON**

1 Glue start Signal – Normally connected to machine control circuitry, to give a signal when machine is running and glue is being applied.

2 Machine stop relay contacts will activate if either of the sensors are UN-plugged whilst power is still connected.

Dimensions

Controller:- L150 x H130 x D60

Sensor:- L110 x H90 x D70

1.0 PRODUCT DESCRIPTION CONTENTS / SPECIFICATION

The Glue Line Sensor is designed to be used as an “online” glue inspection system, and will eject product if the applied glue level on the paper falls outside the set parameters. The sensor measures the amount of glue applied to the paper, and sends this to the controller. The controller will compare this glue value with the saved value in its memory. If the live measured value is greater than, or less than, the set tolerance value, the controller will give an audible and visual alarm and switch on eject output signals to reject the product from the machine.

The specially designed capacitive sensor is housed in a substantial metal housing to eliminate stray capacitance, and incorporates paper guide pins to control paper tracking past the sensor and cleaning air jets to reduce build up of paper dust on the sensor face.

The controller module is designed around an embedded micro processor, capable of high speed data acquisition and output functions, and incorporates a large LDC screen for easy viewing and dedicated keys for easy operation.

The controller incorporates a “Teach Button” (only active when key switch is on) that allows the operator to store the current glue value to memory.

The displayed measured value of glue is expressed as a numeric value between 0 (No glue) to 1023 (Maximum glue)

Tolerance settings are expressed as a percentage value (%) a different tolerance value can be used for the upper & lower limits. There are 6 alternative modes of tolerance set-up as follows:-

A Lower Limit ON (alarms ACTIVE if measured value falls below stored value-Tol %)
B Lower Limit OFF (alarms NOT ACTIVE if measured value falls below stored value-Tol%)
C Upper LIMIT ON (alarms ACTIVE if measured value rises above stored value+Tol%)
D Upper Limit OFF (alarms NOT ACTIVE if measured value rises above stored value+Tol%)
E Upper & Lower Limit ON (alarms ACTIVE if measured value falls below or rises above stored value)
F Upper & Lower Limit OFF (alarms NOT ACTIVE)

The above settings will determine if an output eject & alarm signal is given for a particular mode output signals are only active and alarms only given, if the controller is receiving a glue start signal, indicating that glue is being applied by the machine

System Contents:-

1 off GLS21000 CONTROL MODULE ASSEMBLY
1 off GLS22000 GLUE DETECTOR ASSEMBLY
1 off GLS23000 MACHINE INTERFACE ASSEMBLY (including audible warning device)

Optional Assemblies

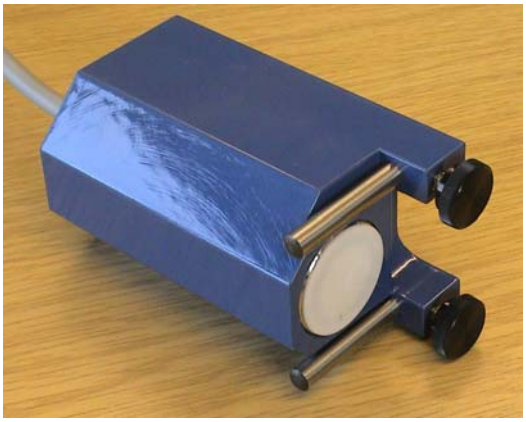
GLS1500 CUT PULSE SENSOR ASSY
GLS24000 PAPER SENSOR ASSY

S.P.I DEVELOPMENTS Ltd
(SPECIAL PURPOSE INSTRUMENTS)

GLS-2 GLUE LINE SENSOR

for

ALL INTERNAL ANCHORAGE LINES or SWIRL



The GLS-2 Glue line sensor has been specifically developed to detect the presence of any type of aqueous glue lines applied to the filter or cigarette paper. The unique sensor scans the whole width of the paper detecting the total amount of glue on either side of the paper, and sends a signal back to the controller. The Controller monitors this signal and will give an eject alarm if the glue application varies from the set parameters.

The sensor measures the total amount of adhesive applied to the paper, therefore even if the correct number of lines or swirls are being applied, but the total volume of adhesive is lower or higher than required, the product will be ejected. Eject value resolution can be set to as little as + or – 1% of total glue application.

The controller is designed as a dedicated unit and features a “Teach” button facility, this allows the operator to automatically set the controller to accept and remember the current value of adhesive being applied. The acceptable + & - tolerance value applied to this signal can be easily changed by the customer.

The Eject output can be configured via the screen to either be a time delay on signal or a full shift register count (adjustable), to allow the faulty product to be ejected at the correct position on the machine.

Because the sensor scans the total area of paper after the glue lines have being applied, any lateral movement (tracking / running adjustments within normal running limits) will not affect the signal.

A second Optional sensor can be plugged in that will read the value of the paper, and deduct this from the adhesive value.

Main Features

- Inputs:- Power = 24vdc input – Glue Start Signal = 12 or 24vdc.
- Outputs:- Eject (selectable shift register) + Xenon & AWD.
- Unique sensor with large scan area complete with paper guide pins.
- Optional plug in second sensor for detecting paper value.
- Glue lines can be detected from either side of the paper, including swirl pattern.
- Normal running paper tracking variations / settings will not affect the glue signal received.
- Audible warning alarm & Xenon lamp will be activated when detecting faulty adhesive application.

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