WOODWARD

Product Manual 26425
(Revision NEW)
Original Instructions

723PLUS Digital Control
Nile River Vessel Generator Control

Dredging International
8301-1146

Application Manual

General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.

Revisions

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, on the *publications page* of the Woodward website:

www.woodward.com/publications

The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

Proper Use

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Revisions—Changes in this publication since the last revision are indicated by a black line alongside the text.

Contents

Illustrations and Tables

Warnings and Notices

Important Definitions

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER**—Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING**—Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**—Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE**—Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT**—Designates an operating tip or maintenance suggestion.

⚠WARNING

Overspeed / Overtemperature / Overpressure

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

⚠WARNING

Personal Protective Equipment

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- **Eye Protection**
- **Hearing Protection**
- **Hard Hat**
- **Gloves**
- **Safety Boots**
- **Respirator**

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

⚠WARNING

Start-up

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

⚠WARNING

Automotive Applications

On- and off-highway Mobile Applications: Unless Woodward's control functions as the supervisory control, customer should install a system totally independent of the prime mover control system that monitors for supervisory control of engine (and takes appropriate action if supervisory control is lost) to protect against loss of engine control with possible personal injury, loss of life, or property damage.

NOTICE

Battery Charging Device

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electrostatic Discharge Awareness

NOTICE

Electrostatic Precautions

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts:

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual *82715*, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Follow these precautions when working with or near the control.

1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
   - Do not touch any part of the PCB except the edges.
   - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
   - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

Chapter 1.
General Information

Introduction

This manual is the functional description of Woodward 723PLUS Control System 8301-1146. This 723PLUS control is made to Dredging International specification as a generator control for the Nile River vessel.

723plus Digital Control	9906-619
GAP Diagram	5418-2825
Block Diagram	9971-1260
Plant Wiring	9971-1259

WARNING

Use of this equipment by untrained or unqualified personnel could result in damage to the control or the installation's equipment and possible loss of life or personal injury. Make sure personnel using or working on this equipment are correctly trained.

This manual covers only equipment which is manufactured by Woodward and does not include operating instructions for the prime mover, or the driven devices or processes. For information about other Woodward units used on the prime mover please refer to the specific Woodward documentation supplied with each unit.

For specific operating information such as start-up, shutdown, and the prime mover's response to signals from the Woodward control, refer to the prime mover manufacturer's manual.

System Compliance

This system complies with the relevant industry specifications and regulations.

General Safety Precautions

Obey the following safety precautions when you install the unit:

- Obey all cautions or warnings given in the procedures.
- Never bypass or override machine safety devices.
- Always use sufficient personnel and/or lifting equipment to move the cabinet.

Identification Plate

The identification plate is installed on the front of the plate in the upper right corner. It contains the following information:

- Part Number
- Serial Number
- Manufacturing Date
- Weight
- Customer Name
- Customer
- Power Supply Information

Always provide the model number and serial number in any correspondence with Woodward.

Chapter 2.
System Description

Introduction

The 723PLUS control for this application receives an analog speed setting signal from an external system. The 723PLUS biases this speed reference for synchronizing purposes, kW droop, and to make the kW base load control possible.

Depending on the actual speed, the control will set maximum load setpoints that will act as a torque limit curve.

Control functions include:
- Speed sensing
- Speed reference
- Droop / KW Control
- Speed Control
- Fuel Limiters
- Alarms

Speed Sensing

The speed sensing of the engine is done by one or two speed sensors. The speed sensors can be proximity probes or magnetic pick-ups.

The influence of the engine firing frequencies is attenuated by a low pass filter.

Speed fault indication

The speed channels are continuously checked for speed sensor failures. A failure is latched when the speed signal drops below 10 rpm or raises above 2000 rpm. The speed sensor fault detection is overridden during shutdown and stays overridden for *10 seconds after Run is selected.

Because the 723PLUS does not act as speed control unit, a double failure of the speed probes does not result in a major alarm. Each sensor can individual be setup, in case of failure, as minor alarm or major alarm.

Speed Reference

On starts the control will run the engine on min speed and will ramp the speed after a adjustable delay to rated. The speed reference can be adjusted by the Raise and Lower contacts or the Remote Speed Reference. To select remote speed reference both the raise and lower contact have to be made. On failure of the remote reference signal the speed can be controlled by the raise and lower contacts.

The speed reference can be adjusted between the Min. Speed Limit and Max. Speed Limit (adjustable in Configure). The range of the remote speed reference is determined by 4mA Rem. Ref. and 20mA Rem Ref. An analog input below 2 mA or above 22 mA will create an alarm.

Droop / KW Control

Load sharing with other prime movers is done in droop. The main engine control has this droop function already internally. For that reason, the droop amount in the 723PLUS is set default to 0%. In case the kW droop must be activated, the droop % must be set to the correct amount. In kW droop, the control uses the load sensor input to calculate the droop. The load can be controlled with the raise and lower or the remote speed setpoint.

If the load reference enable switch is closed, the control can act in kW control. The range of the remote load reference is determined by the 4mA KW Ref and the 20 mA KW Ref. An analog input below 2 mA or above 22 mA will create an alarm on both the remote reference and the load sensor. An alarm of one or both the inputs will disable the KW Control.

Shutdown

The shutdown function, when activated by the external Run/Stop contact, sends a minimum Speed reference signal out. Also in the configure menu one can select if the speed reference should go to minimum speed reference on the event of a Major alarm.

Fuel Limiters

A four-point Speed / KW limiter is present to prevent overloading of the engine dependable on speed. This will overrule the kW setpoint in case this demand will be too much at the actual speed. An additional four-point curve is present to allow a certain extra kW amount per speed setpoint. This can be used in case the torque limit is too critical at certain speed setpoints! Always contact the engine OEM for the correct settings.

Alarms

In this application the following I/O signals can cause an alarm:

- Speed Probe # 1 input
- Speed Probe # 2 input
- Remote Speed Reference input
- Load sensor input
- Remote Load Reference input

These inputs have three types of alarms: no alarm, minor alarm, and major alarm. In the configure mode the type of alarm can be chosen:

- 1 means no alarm
- 2 means minor alarm
- 3 means major alarm

The following failure will always give a major alarm:

- Overspeed

The Overspeed Trip level can be adjusted in the configure mode.

A minor alarm will activate the minor alarm relay output. A major alarm will create a shutdown and will activate the major alarm relay output. To reset an alarm use the external reset.

The shutdown on major alarm can be adjusted to no shutdown on major alarm (when mechanical backup and reverse acting is used)and the relay’s can be adjusted to have NO or NC contacts.

The remote speed input and manifold pressure input can be adjusted as not used. In that case the alarms are overridden and the manifold limiter is set at maximum output.

Chapter 3.
Tunables

Introduction

This chapter describes the parameters that can be tuned or monitored. Where applicable, the nominal setting for each tunable is listed (the nominal values are provided only as a guideline). The actual settings are obtained from the engine manufacturer or determined during commissioning and should be noted in the Actual column for future reference.

Refer to Chapter 4 (Hand-Held Programmer) for instructions about accessing the tunables.

Configure Mode Tunables

**** CONFIGURATION ****
This menu is used to set the desired setpoints for the minimum and maximum speed reference setpoints. Also Overspeed trip setpoint can be set.

Description	Range	Nominal	Actual
Min Speed RPM	(0,2500)	*800	
Max Speed RPM	(0,2500)	*1900	
Overspeed RPM	(0,2500)	*2000	

**** SET ALARMS ****
This menu is used to configure the alarms for each specific parameter.
1= No Alarm
2= Minor Alarm
3= Major Alarm

It is selectable to go to minimum speed reference setpoint in case of major alarm!

Description	Nominal	Range	Actual
Shtdwn on Maj Alarm?	(TRUE,FALSE)	*TRUE	
MPU #1 Failed Alarm?	(1,3)	*2	
MPU #2 Failed Alarm?	(1,3)	*2	
Rem Spd Used?	(TRUE,FALSE)	*TRUE	
Rem Spd Alm?	(2,3)	*2	
Rem Load Used?	(TRUE,FALSE)	*TRUE	
Rem Load Alm?	(2,3)	*2	
KW Sensor Used	(TRUE,FALSE)	*TRUE	
KW Sensor Alm?	(2,3)	*2	
Major Alarm Relay NC ?	(TRUE,FALSE)	*TRUE	
Minor Alarm Relay NC?	(TRUE,FALSE)	*TRUE	

Service Mode Tunables

**** ALARMLOG ****

This menu shows the active alarms and will only be visible in case of an alarm. The first alarm will be logged and can be traced back!

Description	Range	Nominal	Actual
First Alarm	Monitor		
Spd Probe #1 Fault	Monitor		
Spd Probe #2 Fault	Monitor		
Rmt Spd Ref Failed	Monitor		
Rem Ld Ref Failed	Monitor		
KW Trans Failed	Monitor		
Ovrspd Detected	Monitor		
Reset Fist Alarm?	(TRUE,FALSE)	*FALSE	

**** MONITOR ANALOG ****

This menu shows the analog values as described in the parameter description. No parameters can be tuned in this menu.

Description	Range	Nominal	Actual
Engine Speed	Monitor		
Speed Reference	Monitor		
Spdref Before Bias	Monitor		
kW Limiter (kW)	Monitor		
Actual Load (kW)	Monitor		
Load Reference Input (kW)	Monitor		
SPM Input (rpm)	Monitor		

**** MONITOR DISCRETE ****

This menu shows the digital values as described in the parameter description. No parameters can be tuned in this menu.
TRUE means, the input is active, FALSE when it is not active.

Description	Range	Nominal	Actual
Run/Stop Contact	Monitor		
Reset Contact	Monitor		
Lower Contact	Monitor		
Raise Contact	Monitor		
Loadref Enbl Cntct	Monitor		
Synch Rate Contact	Monitor		
Breaker Contact	Monitor		
Release Rtd Contact	Monitor		

**** MONITOR INPUTS ****

This menu shows the analog values as described in the parameter description. No parameters can be tuned in this menu.

Description	Range	Nominal	Actual
Rem Spd Input /mA	Monitor		
Rem Load Input /mA	Monitor		
Load Sens Input /mA	Monitor		
SPM Input / rpm	Monitor		
Speed Probe #1	Monitor		
Speed Probe #2	Monitor		

**** kW LIMITER ****

This menu must be used to setup the kW Limiter. This is a four slope curve, based on speed, that sets the maximum kW setpoint!
Additional an extra kW can be given to above mentioned curve. This also is a four slope, speed dependant curve again!
Always request the correct info for these parameters from the engine OEM.

Description	Range	Nominal	Actual
KW Extra #1	(0.0, 1000,0)	*0	
KW Extra SPD #2	(0.0, 2500,0)	*1600	
KW Extra #2	(0.0, 1000,0)	*0	
KW Extra SPD #3	(0.0, 2500,0)	*1700	
KW Extra #3	(0.0, 1000,0)	*0	
KW Extra SPD #4	(0.0, 2500,0)	*1800	
KW Extra #4	(0.0, 1000,0)	*0	

**** kW DROOP ****
This menu is used to set the droop amount for the kW droop. Droop set to 0 means no droop!

Description	Range	Nominal	Actual
Droop %	(0,10)	*0	

**** SPEED SETTING ****
This menu must be used to set the speed reference parameters as mentioned in the description. Also the analog outputs can be configured in this menu!

Description	Range	Nominal	Actual
Rated Speed	(0,2500)	*1800	
Lower Speed Rate	(0,100)	*15	
Raise Speed Rate	(0,100)	*15	
To Rated Rate	(0,1000)	*100	
Synchro Rate	(0,100)	*2	
4mA Rmt Reference	(0,2500)	*1500	
20mA Rmt Reference	(0,2500)	*1830	
Tacho at 4 mA Output	(0,2500)	*0	
Tacho at 20 mA Output	(0,2500)	*2000	
Speed Ref Out at 4 mA	(0,2500)	*1380	
Speed Ref Out at 20 mA	(0,2500)	*1920	
SPM Input –2 V = rpm	(-100,100)	*-2	
SPM Input +2 V = rpm	(-100,100)	*2	

**** KW MENU ****
This menu is used top set the kW transducer range and kW setpoint input for the control. Also the deadband can be set with this menu. When load error is within the deadband, the control will not bias anymore.

Description	Range	Nominal	Actual
KW Ref at 4 mA	(0,10000)	*0	
KW Ref at 20 mA	(0,10000)	*1900	
Maximum KW	(0,10000)	*1890	
KW Load Sensor at 4 mA	(0,10000)	*0	
KW Load Sensor at 20 mA	(0,10000)	*2127	
KW Control Deadband	(0,100)	*10	

**** SPEED FILTER ****
This menu must be used to set the speed filters of the speed sensor inputs. Too much filtering will result in slow speed update.

Description	Range	Nominal	Actual
Speed Filter 1	(0.01,10.0)	*0.04	
Speed Filter 2	(0.01,10.0)	*0.04	

**** PORTSETTING ****

This menu must be used to switch the J1 port from Handheld (2) into ServLink (1) mode. Reboot of 723 will activate the handheld programmer mode again.

Description	Range	Nominal	Actual
Set Download Mode	(1,2)	*2	

NOTICE

Do not change the port setting. This function is only for trained service personnel.

Chapter 4.
Hand-held Programmer

Hand-held Programmer and Menus

The Hand-held Programmer is a hand-held computer terminal that gets its power from the Control. The terminal connects to the RS-422 communication serial port on the control.

The programmer does a power-up self-test whenever it is plugged into the control. When the self-test is complete, the screen displays two lines of information. This is information relating to the application. Pressing the 'ID' key changes the display to show the Woodward logo with the country name ("Woodward (NL)") and application name of the system. Press ‘ID’ again for the software part number.

The programmer screen is a four-line, back lighted LCD display. The display lets you look at two separate functions or menu items at the same time. Use the “Up/Down Arrow” key to toggle between the two displayed items (an “@” indicates the item in the active menu). Use the BKSP and SPACE keys to scroll through the display to show the remainder of a prompt if it is longer than the display screen's 18 characters.

The Control has three sets of menus: the Service menus, the Configure menus and the Debug menus. The Service menus allow easy access and tuning while the engine is running. The Configure menus may only be entered if the I/O is shutdown, and hence the engine stopped. The Debug menu allows access to the GAP software.

Configure Menus

To access the Configure menus, the engine must be shutdown. Press the . key. The display will show, 'To Enable CONFIGURE Press *ENTER*'. Press the ENTER key and the display will show, 'To Shutdown I/O, Press *ENTER*'. Press the ENTER key and this will allow you to get into the Configure menus.

NOTICE **If the engine is running, it will be shut down because the control’s I/Os are disabled.**

To move between the menus use the ▲ and ▼ keys. To move through the setpoints within a menu use the ◀ and ▶ keys,. Once in a menu, press the ESC key to return to the menu header.

To leave the Configure menus press the ESC key. The message 'Rebooting Control' will appear. The setpoints are automatically saved when leaving Configure.

Service Menus

To access the Service menus press the ▼ key. To move between menus, and to move through setpoints within menus, follow the instructions as for the Configure menus. Also to return to the menu header, or to leave Service, follow the Configure instructions.

Debug Menus

To access the Debug first press ■ (solid square) after which the ▼ key should be pressed. To move between category menus use the ◀ and ▶ keys, once in the right category move through the GAP blocks by using the ▲ and ▼ keys.

Within a GAP block every output and tunable (*) input can been seen by using the ◀ and ▶ keys.

A Tunable (*) can be changed by using the “Turtle Up” or the “Rabbit Up” keys to increase the value, and the “Turtle Down” or “Rabbit Down” keys to decrease the value (see also adjusting setpoints).

To return to the menu header press the ▼ key, or to leave Service, follow the Configure instructions.

Adjusting Setpoints

To adjust a set point, use the “Turtle Up” or the “Rabbit Up” keys to increase the value, and the “Turtle Down” or “Rabbit Down” keys to decrease the value. The “Rabbit Up” and “Rabbit Down” keys will make the rate of change faster than the “Turtle Up” and “Turtle Down” keys. This is useful during initial set-up where a value may need to be changed significantly. Where necessary, to select TRUE, use either the “Turtle Up” or the “Rabbit Up” keys, and to select FALSE, use the “Turtle Down” or “Rabbit Down” keys.

To obtain an exact value, press the “=“ key. Key in the required figure and press ENTER.

IMPORTANT

This may only be done if the figure is within 10% of the existing value.

To save setpoints at any time, use the SAVE key. This transfers all new setpoint values into EEPROM memory. The EEPROM retains all setpoints when power is removed from the control.

NOTICE

To prevent possible damage to the engine resulting from improper control settings, make sure you save the setpoints before removing power from the control. Failure to save the setpoints before removing power from the control causes them to revert to the previously saved settings.

Hand-Held Programmer Keys

The programmer keys have the following functions (see Figure 4-1):

◀ (left arrow)	Moves backward through Configure or Service, one menu at a time.
▶ (right arrow)	Moves forward through Configure or Service, one menu at a time.
(up/down arrow)	Toggles between the two displayed items (the first letter of the active menu item will blink).
▲ (up arrow)	Moves backward through each menu, one step at a time.
▼ (down arrow)	Advances through each menu, one step at a time. Selects Service from Main Screen.
(turtle up)	Increases the displayed set point value slowly.
(turtle down)	Decreases the displayed set point value slowly.

(rabbit up)	Increases the displayed set point value quickly (about 10 times faster than the turtle keys).
(rabbit down)	Decreases the displayed set point value quickly (about 10 times faster than the turtle keys).
– (minus)	Increases setpoint values by one step at a time.
+ (plus)	Decreases setpoint values by one step at a time.
■ (solid square)	Debug mode.
ID	Displays the In-Pulse Woodward logo, application name and software revision.
ESC	To return to menu header or to main screen.
SAVE	Saves entered values (set points).
BKSP	Deletes last figure when entering exact values.
SPACE	Not used.
ENTER	Used when entering exact values and accessing Configure.
= (equals)	To enter exact values (within 10%).
• (decimal)	To select Configure.

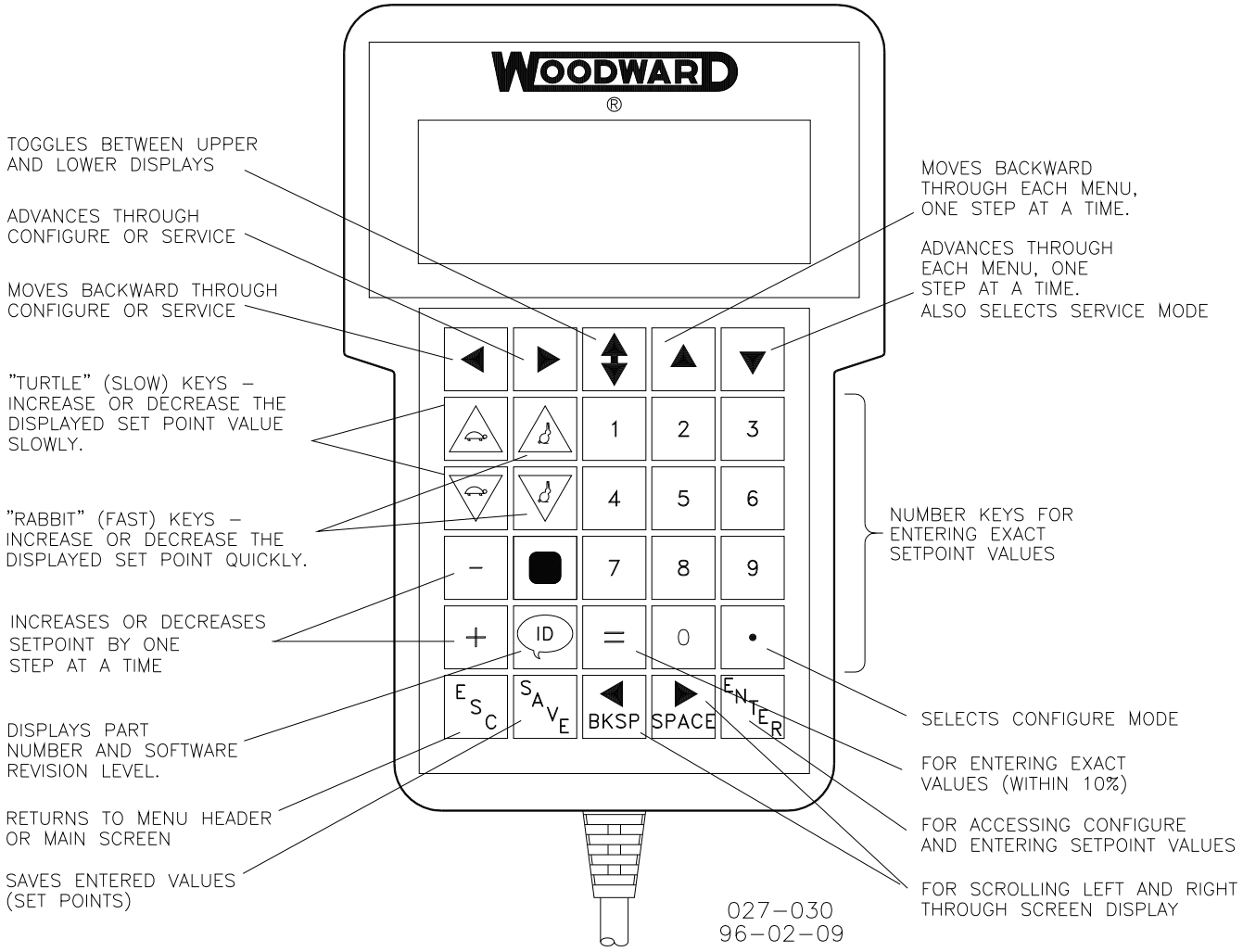


Figure 4-1. Hand-held Programmer

Chapter 5.
Control Wiring Diagram

This chapter contains the Control Wiring Diagram 9971-1259. Sheet one of the drawing contains notes and additional information. The following sheets identify the system cables and show their interconnections, and give the pin-out detail of each cable connector.

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
NEW	E/C 1099208	APR-2007	MSMEET

WOODWARD

CONTROL WIRING DIAGRAM

SYSTEM 8301-1146

NILE RIVER
GENERATOR CATERPILLAR

FRONT SHEET

WOODWARD GOVERNOR NEDERLAND B.V.
INDUSTRIAL CONTROLS GROUP
HOOFDDORP, THE NETHERLANDS

DIAGRAM - CONTROL WIRING:
NILE RIVER
GENERATOR CATERPILLAR

DWG NO: 9971-1259
REV: NEW
CAGE CODE:
SIZE: A3
SCALE:
CHECKED: MSMEET
DRAWN: GROMAN
SHEET: 1 OF 6
DATE: APR. 2007

NOTES:

1. SHIELDED WIRES ARE TWISTED PAIRS, WITH SHIELD GROUNDED AT ONE END ONLY.
WHEN MOUNTING CONTROL TO BULKHEAD, USE THE GROUNDING STUD AND
HARDWARE SUPPLIED WITH THE CHASSIS TO ENSURE PROPER GROUNDING.

2. SHIELD MUST NOT BE GROUNDED AT ANY EXTERNAL POINT UNLESS OTHERWISE NOTED.

3. ALL SHIELDS MUST BE CARRIED CONTINUOUSLY THROUGH ALL TERMINAL BLOCKS AND MUST BE TIED
TO OTHER SHIELDS EXCEPT AT THE COMMON GROUND POINT.
THE SHIELDS ARE TIED TOGETHER AT THE GROUND STUD.

4. REMOVE JUMPER FOR VOLTAGE INPUT.

5. REMOVE JUMPER BETWEEN 37 & 38 IF USING EXTERNAL DISCRETE INPUT POWER.
FOR EXTERNAL DISCRETE INPUT POWER, USE TERMINAL 37 FOR (-) AND (+) TO APPROPRIATE SWITCH.

6. DISCRETE INPUTS ARE ISOLATED FROM OTHER CIRCUITS AND INTENDED TO BE POWERED BY TB1-39 (+24VDC) LEAVING
THE JUMPER IN PLACE. INPUT CURRENT IS NORMALLY 10 MILLIAMPERES PER INPUT INTO 2210 OHM.

7. UNLESS OTHERWISE SPECIFIED:
   A. RELAYS SHOWN DE-ENERGIZED.
   B. RELAYS ENERGIZE FOR FUNCTION.
   C. RELAY CONTACT RATING FOR MINIMUM 100.000 OPERATIONS:
      RESISTIVE- 2.0 AMPERES AT 28VDC
                 0.1 AMPERES AT 115VAC, 50 TO 400Hz
      INDUCTIVE- 0.75 AMPERES AT 28VDC, 0.2 HENRY
                 0.1 AMPERES AT 28VDC, LAMP

8. ANALOG OUTPUT SIGNALS TO OTHER SYSTEMS MUST BE ISOLATED FROM GROUND EITHER BY DESIGN OR EMPLOYEMENT
OF ISOLATION AMPLIFIERS.

9. ANALOG INPUT SIGNALS FROM OTHER SYSTEMS MUST BE ISOLATED FROM GROUND EITHER BY DESIGN OR EMPLOYMENT
OF ISOLATION AMPLIFIERS.

10. FACTORY SET FOR MPU INPUT.

13. INTERNAL POWER SUPPLY PROVIDES DC ISOLATION BETWEEN THE POWER SOURCE AND ALL OTHER INPUTS AND OUTPUTS.

14. COMMUNICATION PORT J1 CAN ONLY BE USED WITH WOODWARD ST2000 HANDHELD PROGRAMMER (P/N 9907-205).

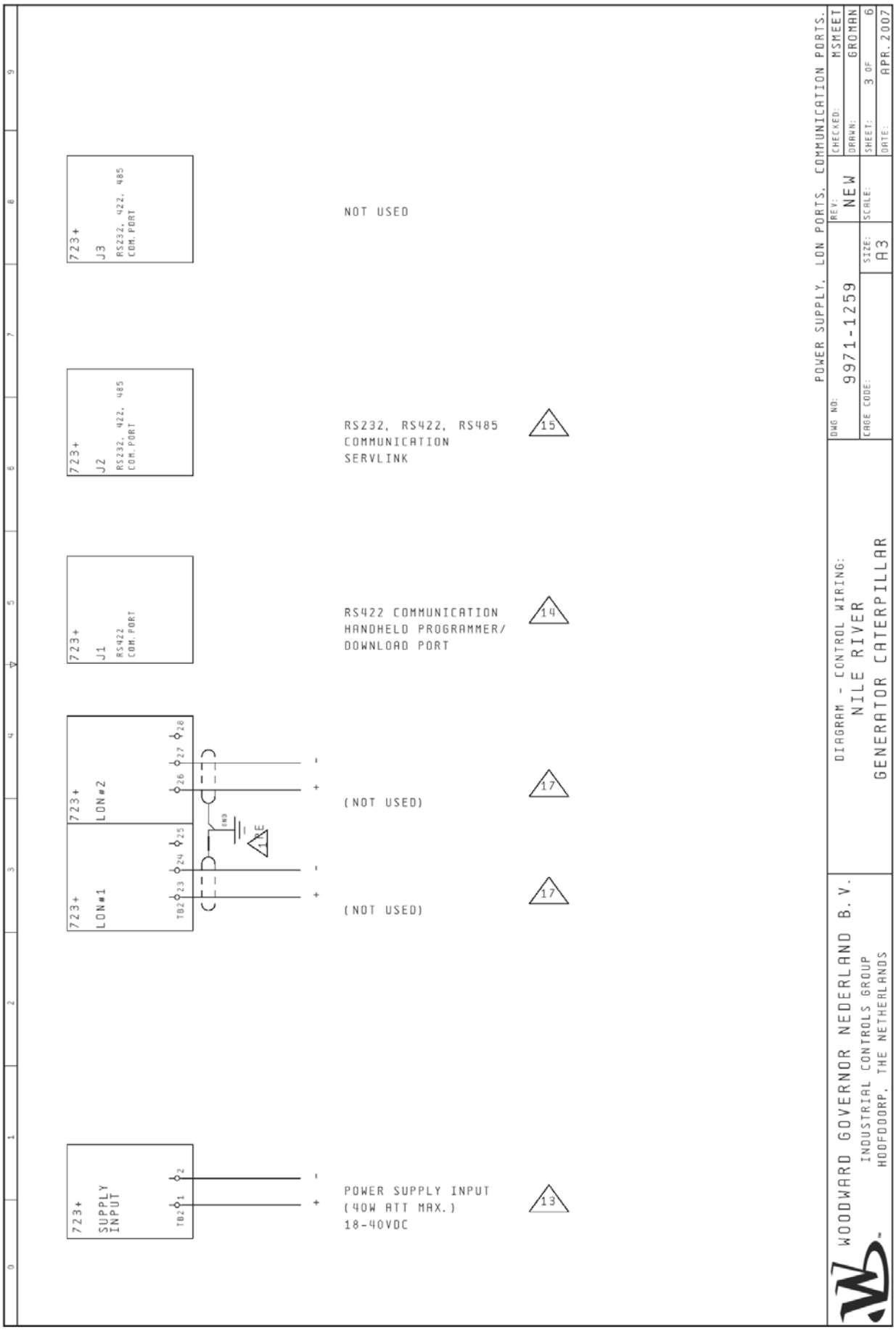
15. COMMUNICATION PORT J2 OR J3 CAN BE CONFIGURED AS A RS-232, RS-422 OR RS-485 SERIAL INTERFACE.
PORT CONFIGURATION CAN BE DONE IN THE APPLICATION SOFTWARE ONLY.
FOR THE PIN ASSIGNMENT OF J2 AND J3 SEE HARDWARE MANUAL 02758.

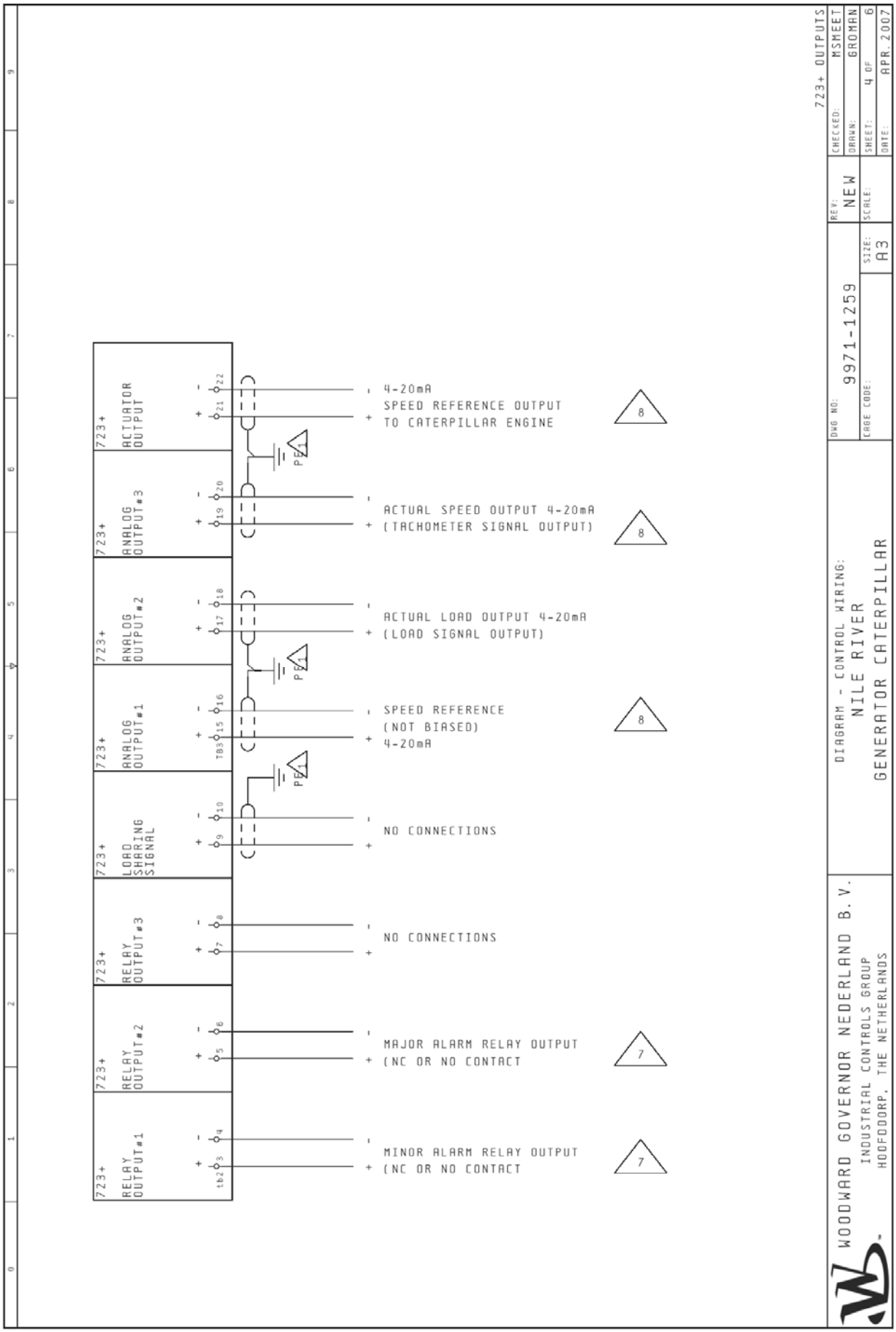
16. IF ONE SPEED INPUT IS USED, JUMPER 11 TO 13 AND 12 TO 14.

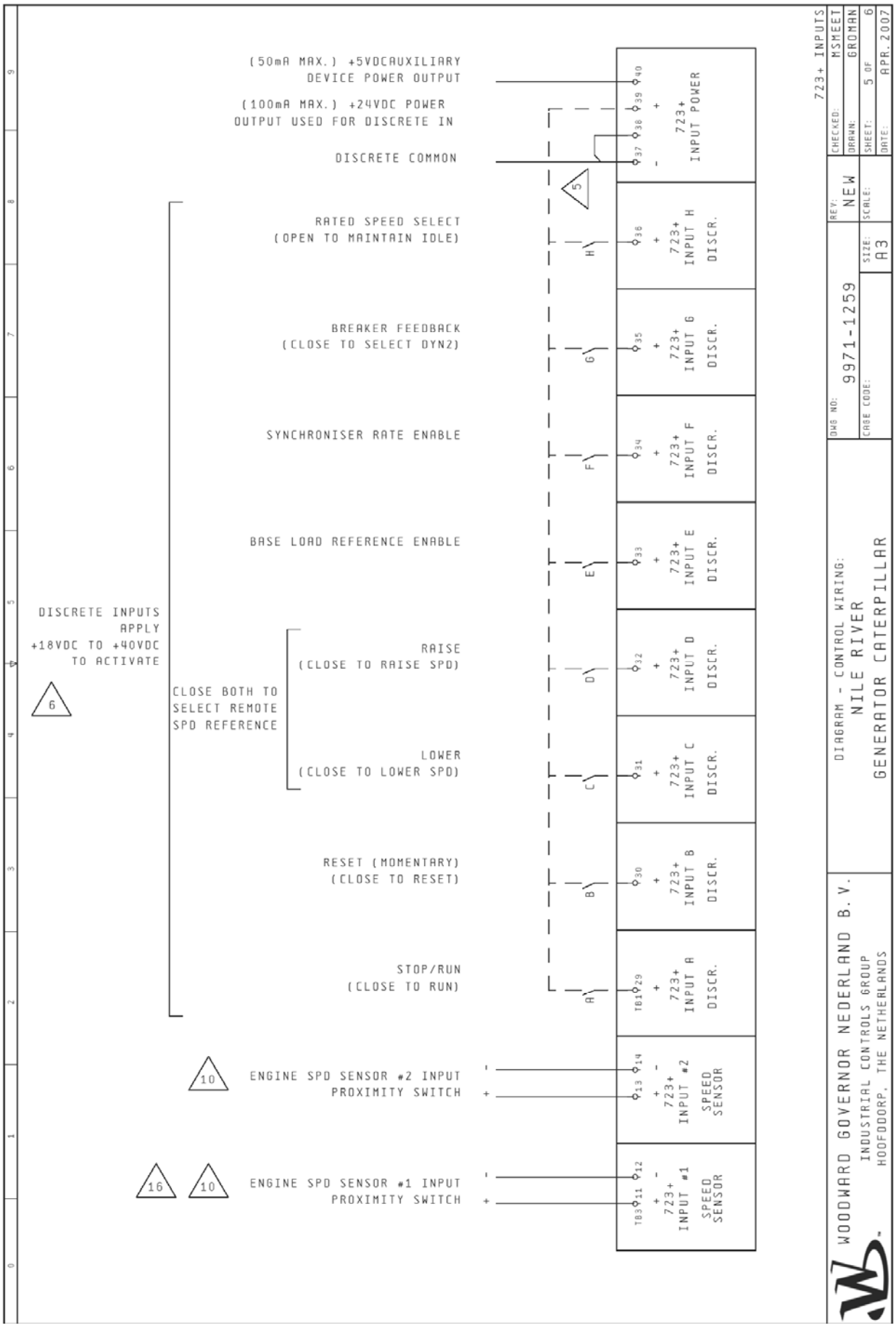
17. USE TWISTED PAIR SHIELDED WIRES ONLY.

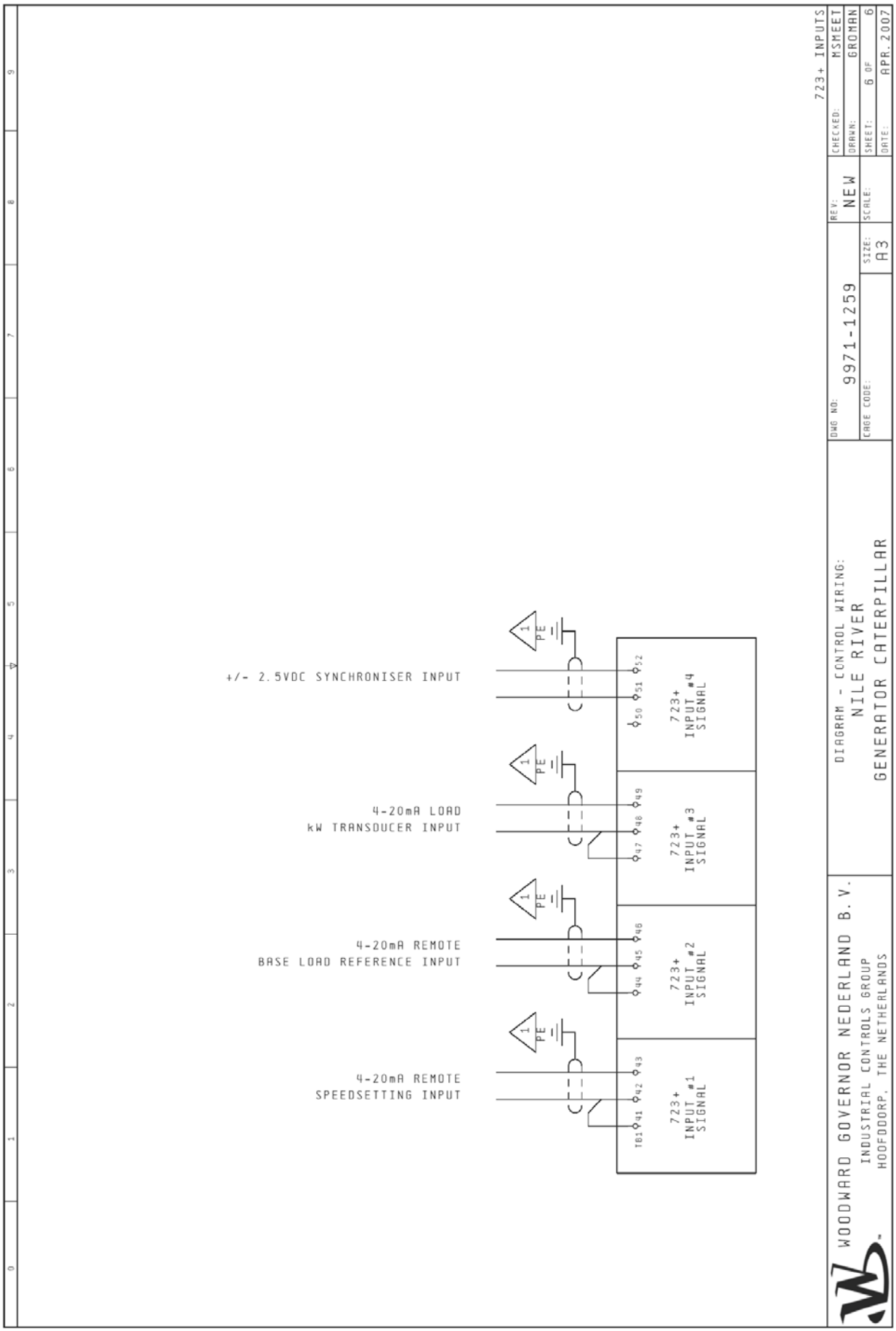
NOTES

WOODWARD GOVERNOR NEDERLAND B.V. INDUSTRIAL CONTROLS GROUP HOOFDDORP, THE NETHERLANDS	DIAGRAM - CONTROL WIRING: NILE RIVER GENERATOR CATERPILLAR	DWG NO: 9971-1259	REV: NEW	CHECKED: MSMEET
		CAGE CODE:	SIZE: A3	DRAWN: GROMAN
		SCALE:		SHEET: 2 OF 6
				DATE: APR. 2007


723+
SUPPLY INPUT
TB2
1
2
POWER SUPPLY INPUT
(40W ATT MAX.)
18-40VDC
13
723+
LON#1
723+
LON#2
TB2
23
24
25
26
27
28
GND
12
(NOT USED)
17
(NOT USED)
17
723+
J1
RS422
COM.PORT
RS422 COMMUNICATION
HANDHELD PROGRAMMER/
DOWNLOAD PORT
14
723+
J2
RS232, 422, 485
COM.PORT
RS232, RS422, RS485
COMMUNICATION
SERVLINK
15
723+
J3
RS232, 422, 485
COM.PORT
NOT USED
POWER SUPPLY, LON PORTS, COMMUNICATION PORTS.
DWG NO: 9971-1259
REV: NEW
CAGE CODE:
SIZE: A3
SCALE:
CHECKED: MSMEET
DRAWN: GROMAN
SHEET: 3 OF 6
DATE: APR.2007
DIAGRAM - CONTROL WIRING:
NILE RIVER
GENERATOR CATERPILLAR
WOODWARD GOVERNOR NEDERLAND B.V.
INDUSTRIAL CONTROLS GROUP
HOOFDDORP, THE NETHERLANDS

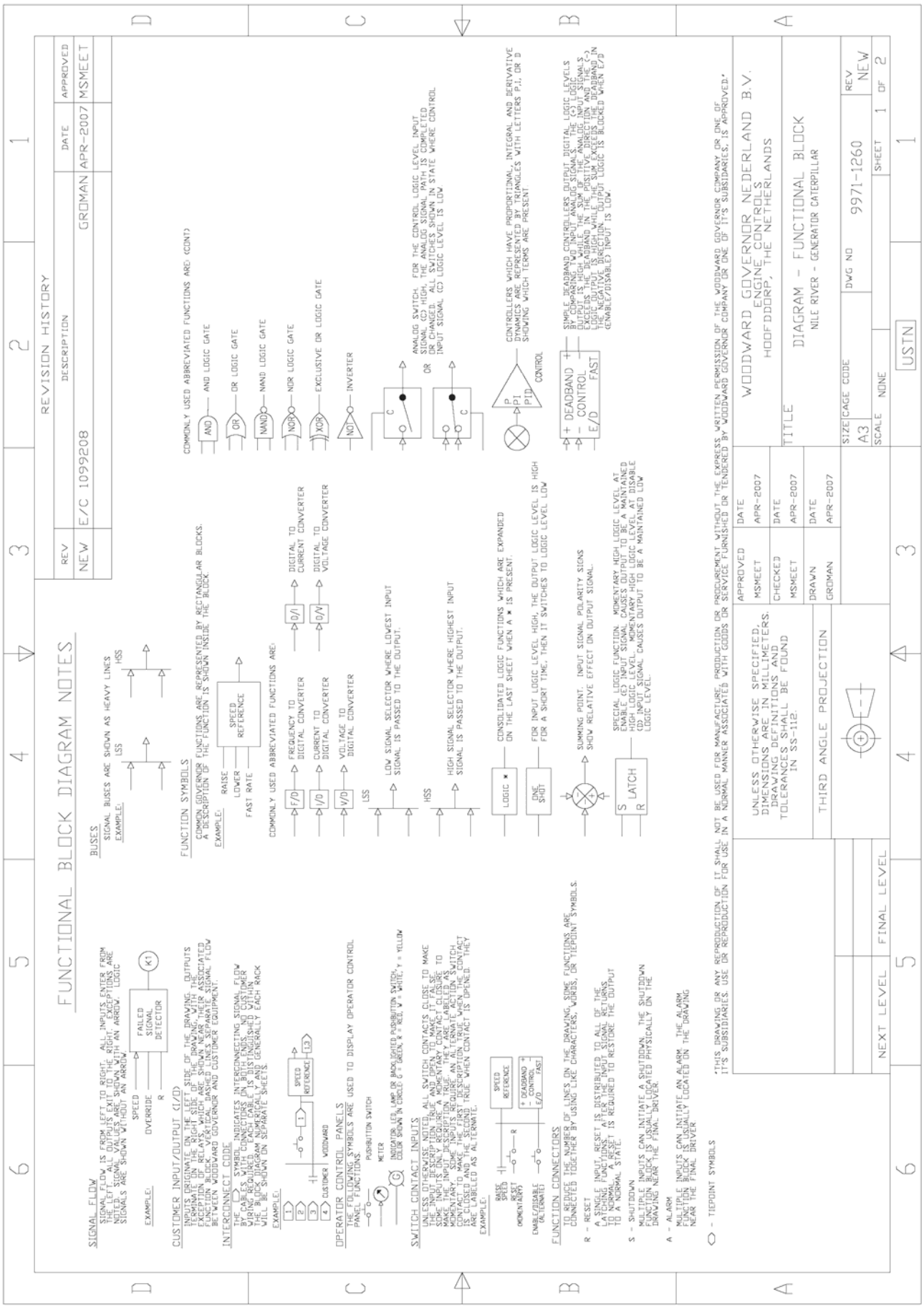

723+ OUTPUTS
723+ ACTUATOR OUTPUT
723+ ANALOG OUTPUT#3
723+ ANALOG OUTPUT#2
723+ ANALOG OUTPUT#1
723+ LOAD SHARING SIGNAL
723+ RELAY OUTPUT#3
723+ RELAY OUTPUT#2
723+ RELAY OUTPUT#1
4-20mA
SPEED REFERENCE OUTPUT
TO CATERPILLAR ENGINE
ACTUAL SPEED OUTPUT 4-20mA
(TACHOMETER SIGNAL OUTPUT)
ACTUAL LOAD OUTPUT 4-20mA
(LOAD SIGNAL OUTPUT)
SPEED REFERENCE
(NOT BIASED)
4-20mA
NO CONNECTIONS
NO CONNECTIONS
MAJOR ALARM RELAY OUTPUT
(NC OR NO CONTACT
MINOR ALARM RELAY OUTPUT
(NC OR NO CONTACT
PE1
PE1
PE1
8
8
8
7
7
WOODWARD GOVERNOR NEDERLAND B.V.
INDUSTRIAL CONTROLS GROUP
HOOFDDORP, THE NETHERLANDS
DIAGRAM - CONTROL WIRING:
NILE RIVER
GENERATOR CATERPILLAR
DWG NO: 9971-1259
REV: NEW
SIZE: A3
SCALE:
CAGE CODE:
CHECKED: MSHEET
DRAWN: GROMAN
SHEET: 4 OF 6
DATE: APR.2007

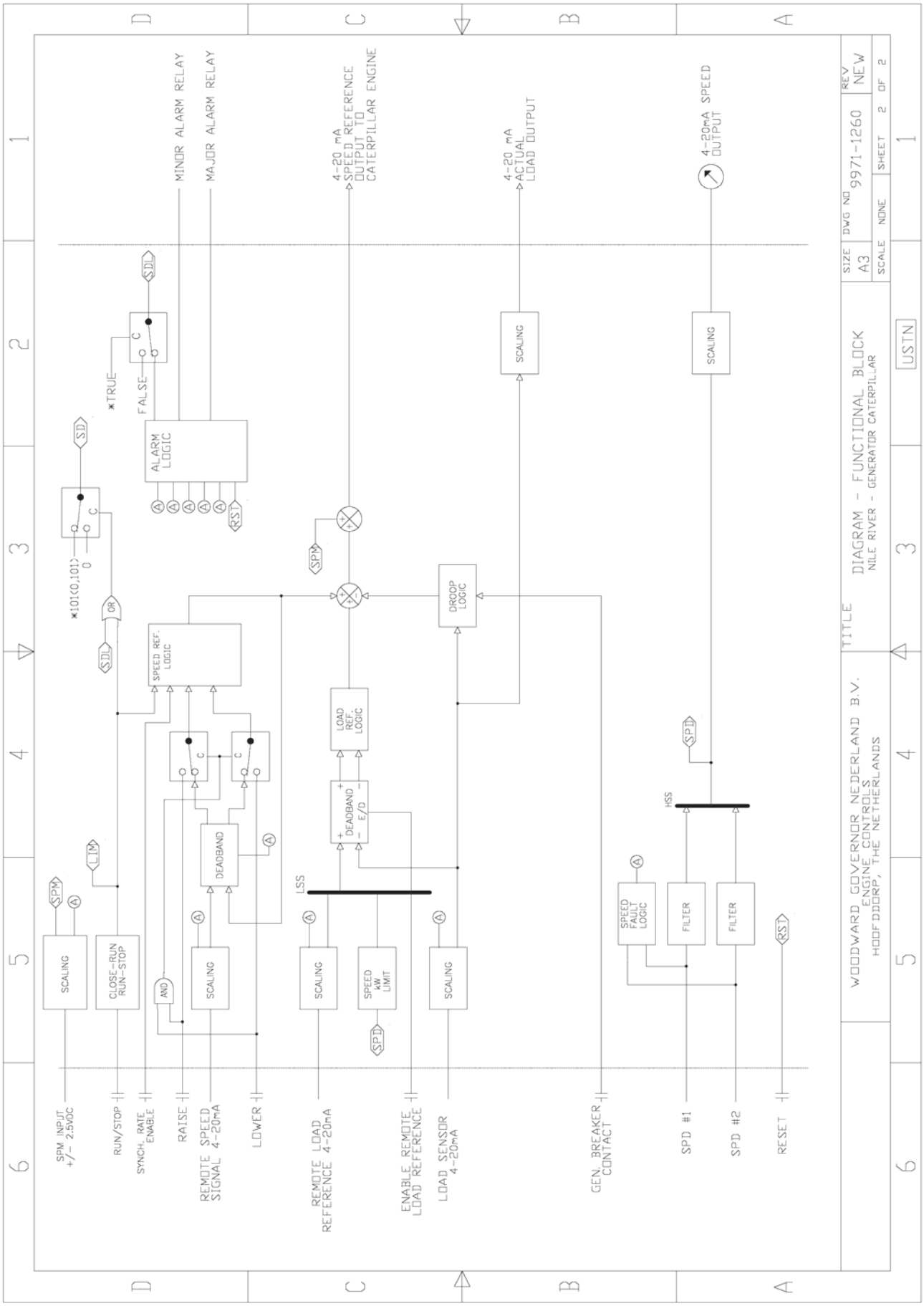

(50mA MAX.) +5VDCAUXILIARY DEVICE POWER OUTPUT
(100mA MAX.) +24VDC POWER OUTPUT USED FOR DISCRETE IN
DISCRETE COMMON
723+ INPUT POWER
RATED SPEED SELECT (OPEN TO MAINTAIN IDLE)
723+ INPUT H DISCR.
BREAKER FEEDBACK (CLOSE TO SELECT DYN2)
723+ INPUT G DISCR.
SYNCHRONISER RATE ENABLE
723+ INPUT F DISCR.
BASE LOAD REFERENCE ENABLE
723+ INPUT E DISCR.
DISCRETE INPUTS APPLY +18VDC TO +40VDC TO ACTIVATE
CLOSE BOTH TO SELECT REMOTE SPD REFERENCE
RAISE (CLOSE TO RAISE SPD)
723+ INPUT D DISCR.
LOWER (CLOSE TO LOWER SPD)
723+ INPUT C DISCR.
RESET (MOMENTARY) (CLOSE TO RESET)
723+ INPUT B DISCR.
STOP/RUN (CLOSE TO RUN)
723+ INPUT A DISCR.
ENGINE SPD SENSOR #2 INPUT PROXIMITY SWITCH
723+ INPUT #2 SPEED SENSOR
ENGINE SPD SENSOR #1 INPUT PROXIMITY SWITCH
723+ INPUT #1 SPEED SENSOR
723+ INPUTS
WOODWARD GOVERNOR NEDERLAND B.V.
INDUSTRIAL CONTROLS GROUP
HOOFDDORP, THE NETHERLANDS
DIAGRAM - CONTROL WIRING:
NILE RIVER
GENERATOR CATERPILLAR
DWG NO: 9971-1259
CASE CODE:
REV: NEW
SIZE: A3
SCALE:
CHECKED: MSMEET
DRAWN: GBOMAN
SHEET: 5 OF 6
DATE: APR.2007


723+ INPUTS
CHECKED: MSMEET
DRAWN: GROMAN
SHEET: 6 OF 6
DATE: APR.2007
REV: NEW
SCALE:
SIZE: A3
DWG NO: 9971-1259
CAGE CODE:
DIAGRAM - CONTROL WIRING:
NILE RIVER
GENERATOR CATERPILLAR
WOODWARD GOVERNOR NEDERLAND B.V.
INDUSTRIAL CONTROLS GROUP
HOOFDDORP, THE NETHERLANDS
+/- 2.5VDC SYNCHRONISER INPUT
4-20mA LOAD
kW TRANSDUCER INPUT
4-20mA REMOTE
BASE LOAD REFERENCE INPUT
4-20mA REMOTE
SPEEDSETTING INPUT
723+
INPUT #1
SIGNAL
723+
INPUT #2
SIGNAL
723+
INPUT #3
SIGNAL
723+
INPUT #4
SIGNAL
PE

Chapter 6.
Functional Block Diagram

This chapter contains Functional Block Diagram 9971-1260.


FUNCTIONAL BLOCK DIAGRAM NOTES
REVISION HISTORY
REV
DESCRIPTION
DATE
APPROVED
NEW
E/C 1099208
GROMAN
APR-2007
MSMEET
SIGNAL FLOW
SIGNAL FLOW IS FROM LEFT TO RIGHT. ALL INPUTS ENTER FROM THE LEFT SIDE. ALL OUTPUTS EXIT TO THE RIGHT. EXCEPTIONS ARE SIGNALS WITH VALUE SHOWN AND SIGNALS WITH AN ARROW. LOGIC SIGNALS ARE SHOWN WITHOUT AN ARROW.
EXAMPLE:
SPEED
OVERRIDE
FAILED SIGNAL DETECTOR
K1
CUSTOMER INPUT/OUTPUT (I/O)
INPUTS ORIGINATE ON THE LEFT SIDE OF THE DRAWING. OUTPUTS TERMINATE ON THE RIGHT SIDE OF THE DRAWING, WITH THE EXCEPTION OF RELAYS, WHICH ARE SHOWN NEAR THEIR ASSOCIATED CONTACTS. ALL CUSTOMER I/O SHOULD BE ROUTED THROUGH TERMINAL STRIPS BETWEEN WOODWARD GOVERNOR AND CUSTOMER EQUIPMENT.
INTERCONNECT CODE
THE ⟨⟩ SYMBOL INDICATES INTERCONNECTING SIGNAL FLOW BY CABLES WITH CONNECTORS ON BOTH ENDS. NO CUSTOMER WIRING REQUIRED. EACH CABLE IS DISTINGUISHED WITHIN THE BLOCK DIAGRAM BY A UNIQUE NUMBER. CABLES WILL BE SHOWN ON SEPARATE SHEETS.
EXAMPLE:
1
2
3
4
SPEED REFERENCE
13
CUSTOMER
WOODWARD
OPERATOR CONTROL PANELS
THE FOLLOWING SYMBOLS ARE USED TO DISPLAY OPERATOR CONTROL PANEL FUNCTIONS.
PUSHBUTTON SWITCH
METER
INDICATOR, LED, LAMP OR BACKLIGHTED PUSHBUTTON SWITCH, Y = YELLOW
COLOR SHOWN IN CIRCLE G = GREEN, R = RED, W = WHITE,
SWITCH CONTACT INPUTS
UNLESS OTHERWISE NOTED, ALL SWITCH CONTACTS CLOSE TO MAKE THE INPUT DESCRIPTION TRUE AND OPEN TO MAKE IT FALSE. TO MAKE THE INPUT DESCRIPTION TRUE WHEN THE CONTACT IS OPEN, MAKE THE INPUT DESCRIPTION FALSE. MOMENTARY CONTACTS ARE LABELED AS SUCH. SOME INPUTS REQUIRE AN ALTERNATE ACTION SWITCH CONTACT TO MAKE THE INPUT DESCRIPTION TRUE WHEN THE CONTACT IS OPENED. THEY ARE LABELED AS ALTERNATE.
EXAMPLE:
RAISE SPEED
LOWER SPEED
MOMENTARY
RESET
ENABLE/DISABLE (ALTERNATE)
SPEED REFERENCE
+ DEADBAND -
CONTROL
E/D FAST
FUNCTION CONNECTORS
TO REDUCE THE NUMBER OF LINES ON THE DRAWING, SOME FUNCTIONS ARE CONNECTED TOGETHER BY USING LIKE CHARACTERS, WORDS, OR TIEPOINT SYMBOLS.
R - RESET
A SINGLE INPUT RESET IS DISTRIBUTED TO ALL OF THE LATCHING FUNCTIONS. AFTER THE INPUT SIGNAL RETURNS TO A NORMAL STATE, A RESET IS REQUIRED TO RESTORE THE OUTPUT TO A NORMAL STATE.
S - SHUTDOWN
MULTIPLE INPUTS CAN INITIATE A SHUTDOWN. THE SHUTDOWN FUNCTION IS INITIATED PHYSICALLY ON THE DRAWING NEAR THE FINAL DRIVER.
A - ALARM
MULTIPLE INPUTS CAN INITIATE AN ALARM. THE ALARM FUNCTION BLOCK IS USUALLY LOCATED ON THE DRAWING NEAR THE FINAL DRIVER.
◇ - TIEPOINT SYMBOLS
BUSES
SIGNAL BUSSES ARE SHOWN AS HEAVY LINES.
EXAMPLE:
LSS
HSS
FUNCTION SYMBOLS
COMMON GOVERNOR FUNCTIONS ARE REPRESENTED BY RECTANGULAR BLOCKS. A DESCRIPTION OF THE FUNCTION IS SHOWN INSIDE THE BLOCK.
EXAMPLE:
RAISE
LOWER
FAST RATE
SPEED REFERENCE
COMMONLY USED ABBREVIATED FUNCTIONS ARE:
F/D
FREQUENCY TO DIGITAL CONVERTER
I/D
CURRENT TO DIGITAL CONVERTER
V/D
VOLTAGE TO DIGITAL CONVERTER
LSS
LOW SIGNAL SELECTOR WHERE LOWEST INPUT SIGNAL IS PASSED TO THE OUTPUT.
HSS
HIGH SIGNAL SELECTOR WHERE HIGHEST INPUT SIGNAL IS PASSED TO THE OUTPUT.
LOGIC ✖
CONSOLIDATED LOGIC FUNCTIONS WHICH ARE EXPANDED ON THE LAST SHEET WHEN A ✖ IS PRESENT.
ONE SHOT
FOR INPUT LOGIC LEVEL HIGH, THE OUTPUT LOGIC LEVEL IS HIGH FOR A SHORT TIME, THEN IT SWITCHES TO LOGIC LEVEL LOW
SUMMING POINT. INPUT SIGNAL POLARITY SIGNS SHOW RELATIVE EFFECT ON OUTPUT SIGNAL.
S
LATCH
R
SPECIAL LOGIC FUNCTION. MOMENTARY HIGH LOGIC LEVEL AT ENABLE (E) INPUT SIGNAL CAUSES OUTPUT TO BE A MAINTAINED HIGH LOGIC LEVEL. MOMENTARY HIGH LOGIC LEVEL AT DISABLE (D) INPUT SIGNAL CAUSES OUTPUT TO BE A MAINTAINED LOW LOGIC LEVEL.
COMMONLY USED ABBREVIATED FUNCTIONS ARE: (CONT)
AND
AND LOGIC GATE
OR
OR LOGIC GATE
NAND
NAND LOGIC GATE
NOR
NOR LOGIC GATE
XOR
EXCLUSIVE OR LOGIC GATE
NOT
INVERTER
C
ANALOG SWITCH. FOR THE CONTROL LOGIC LEVEL INPUT SIGNAL (C) HIGH, THE ANALOG SIGNAL PATH IS COMPLETED OR CHANGED. ALL SWITCHES SHOWN IN STATE WHERE CONTROL INPUT SIGNAL (C) LOGIC LEVEL IS LOW
OR
P
PI
PID
CONTROL
CONTROLLERS WHICH HAVE PROPORTIONAL, INTEGRAL AND DERIVATIVE DYNAMICS ARE REPRESENTED BY TRIANGLES WITH LETTERS P, I, OR D SHOWING WHICH TERMS ARE PRESENT
+ DEADBAND -
CONTROL
E/D FAST
SIMPLE DEADBAND CONTROLLERS OUTPUT DIGITAL LOGIC LEVELS BY COMPARING TWO INPUT ANALOG SIGNALS. THE (+) LOGIC OUTPUT IS HIGH WHEN THE SUM OF ANALOG SIGNALS C-2 EXCEEDS THE MINUS (-) INPUT SIGNAL C-1 BY THE DEADBAND AMOUNT. THE LOGIC OUTPUT IS HIGH WHILE THE SUM EXCEEDS THE DEADBAND IN THE NEGATIVE DIRECTION. OUTPUT LOGIC IS BLOCKED WHEN E/D (ENABLE/DISABLE) INPUT IS LOW.
THIS DRAWING OR ANY REPRODUCTION OF IT SHALL NOT BE USED FOR MANUFACTURE, PRODUCTION OR PROCUREMENT WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE WOODWARD GOVERNOR COMPANY OR ONE OF IT'S SUBSIDIARIES. USE OR REPRODUCTION FOR USE IN A NORMAL MANNER ASSOCIATED WITH GOODS OR SERVICE FURNISHED OR TENDERED BY WOODWARD GOVERNOR COMPANY OR ONE OF IT'S SUBSIDARIES, IS APPROVED.
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS. DRAWING DEFINITIONS AND TOLERANCES SHALL BE FOUND IN SS-112.
THIRD ANGLE PROJECTION
APPROVED MSMEET DATE APR-2007
CHECKED MSMEET DATE APR-2007
DRAWN GROMAN DATE APR-2007
WOODWARD GOVERNOR NEDERLAND B.V.
ENGINE CONTROLS
HOOFDDORP, THE NETHERLANDS
TITLE
DIAGRAM - FUNCTIONAL BLOCK
NILE RIVER - GENERATOR CATERPILLAR
SIZE A3
CAGE CODE
DWG NO 9971-1260
REV NEW
SCALE NONE
USTN
SHEET 1 OF 2
NEXT LEVEL
FINAL LEVEL


MINOR ALARM RELAY
MAJOR ALARM RELAY
4-20 mA SPEED REFERENCE OUTPUT TO CATERPILLAR ENGINE
4-20 mA ACTUAL LOAD OUTPUT
4-20mA SPEED OUTPUT
SCALING
SCALING
ALARM LOGIC
SPEED REF. LOGIC
DROOP LOGIC
LOAD REF. LOGIC
DEADBAND
SCALING
CLOSE-RUN RUN-STOP
SCALING
SPEED kW LIMIT
SCALING
SPEED FAULT LOGIC
FILTER
FILTER
SPM INPUT +/- 2.5VDC
RUN/STOP
SYNCH., RATE ENABLE
RAISE
REMOTE SPEED SIGNAL 4-20mA
LOWER
REMOTE LOAD REFERENCE 4-20mA
ENABLE REMOTE LOAD REFERENCE
LOAD SENSOR 4-20mA
GEN. BREAKER CONTACT
SPD #1
SPD #2
RESET
WOODWARD GOVERNOR NEDERLAND B.V.
ENGINE CONTROLS
HOOFDDORP, THE NETHERLANDS
TITLE
DIAGRAM - FUNCTIONAL BLOCK
NILE RIVER - GENERATOR CATERPILLAR
SIZE A3
DWG NO 9971-1260
REV NEW
SCALE NONE
SHEET 2 OF 2
USTN

Chapter 7.
Product Support and Service Options

Product Support Options

If you are experiencing problems with the installation, or unsatisfactory performance of a Woodward product, the following options are available:

1. Consult the troubleshooting guide in the manual.
2. Contact the **OE Manufacturer or Packager** of your system.
3. Contact the **Woodward Business Partner** serving your area.
4. Contact Woodward technical assistance via email (**EngineHelpDesk@Woodward.com**) with detailed information on the product, application, and symptoms. Your email will be forwarded to an appropriate expert on the product and application to respond by telephone or return email.
5. If the issue cannot be resolved, you can select a further course of action to pursue based on the available services listed in this chapter.

OEM or Packager Support: Many Woodward controls and control devices are installed into the equipment system and programmed by an Original Equipment Manufacturer (OEM) or Equipment Packager at their factory. In some cases, the programming is password-protected by the OEM or packager, and they are the best source for product service and support. Warranty service for Woodward products shipped with an equipment system should also be handled through the OEM or Packager. Please review your equipment system documentation for details.

Woodward Business Partner Support: Woodward works with and supports a global network of independent business partners whose mission is to serve the users of Woodward controls, as described here:

- A **Full-Service Distributor** has the primary responsibility for sales, service, system integration solutions, technical desk support, and aftermarket marketing of standard Woodward products within a specific geographic area and market segment.
- An **Authorized Independent Service Facility (AISF)** provides authorized service that includes repairs, repair parts, and warranty service on Woodward's behalf. Service (not new unit sales) is an AISF's primary mission.
- A **Recognized Engine Retrofitter (RER)** is an independent company that does retrofits and upgrades on reciprocating gas engines and dual-fuel conversions, and can provide the full line of Woodward systems and components for the retrofits and overhauls, emission compliance upgrades, long term service contracts, emergency repairs, etc.

A current list of Woodward Business Partners is available at **www.woodward.com/directory**.

Product Service Options

Depending on the type of product, the following options for servicing Woodward products may be available through your local Full-Service Distributor or the OEM or Packager of the equipment system.

- Replacement/Exchange (24-hour service)
- Flat Rate Repair
- Flat Rate Remanufacture

Replacement/Exchange: Replacement/Exchange is a premium program designed for the user who is in need of immediate service. It allows you to request and receive a like-new replacement unit in minimum time (usually within 24 hours of the request), providing a suitable unit is available at the time of the request, thereby minimizing costly downtime.

This option allows you to call your Full-Service Distributor in the event of an unexpected outage, or in advance of a scheduled outage, to request a replacement control unit. If the unit is available at the time of the call, it can usually be shipped out within 24 hours. You replace your field control unit with the like-new replacement and return the field unit to the Full-Service Distributor.

Flat Rate Repair: Flat Rate Repair is available for many of the standard mechanical products and some of the electronic products in the field. This program offers you repair service for your products with the advantage of knowing in advance what the cost will be.

Flat Rate Remanufacture: Flat Rate Remanufacture is very similar to the Flat Rate Repair option, with the exception that the unit will be returned to you in "like-new" condition. This option is applicable to mechanical products only.

Returning Equipment for Repair

If a control (or any part of an electronic control) is to be returned for repair, please contact your Full-Service Distributor in advance to obtain Return Authorization and shipping instructions.

When shipping the item(s), attach a tag with the following information:
- return number;
- name and location where the control is installed;
- name and phone number of contact person;
- complete Woodward part number(s) and serial number(s);
- description of the problem;
- instructions describing the desired type of repair.

Packing a Control

Use the following materials when returning a complete control:
- protective caps on any connectors;
- antistatic protective bags on all electronic modules;
- packing materials that will not damage the surface of the unit;
- at least 100 mm (4 inches) of tightly packed, industry-approved packing material;
- a packing carton with double walls;
- a strong tape around the outside of the carton for increased strength.

NOTICE

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual 82715, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Replacement Parts

When ordering replacement parts for controls, include the following information:
- the part number(s) (XXXX-XXXX) that is on the enclosure nameplate;
- the unit serial number, which is also on the nameplate.

Engineering Services

Woodward's Full-Service Distributors offer various Engineering Services for our products. For these services, you can contact the Distributor by telephone or by email.

- Technical Support
- Product Training
- Field Service

Technical Support is available from your equipment system supplier, your local Full-Service Distributor, or from many of Woodward's worldwide locations, depending upon the product and application. This service can assist you with technical questions or problem solving during the normal business hours of the Woodward location you contact.

Product Training is available as standard classes at many Distributor locations. Customized classes are also available, which can be tailored to your needs and held at one of our Distributor locations or at your site. This training, conducted by experienced personnel, will assure that you will be able to maintain system reliability and availability.

Field Service engineering on-site support is available, depending on the product and location, from one of our Full-Service Distributors. The field engineers are experienced both on Woodward products as well as on much of the non-Woodward equipment with which our products interface.

For information on these services, please contact one of the Full-Service Distributors listed at **www.woodward.com/directory**.

Contacting Woodward's Support Organization

For the name of your nearest Woodward Full-Service Distributor or service facility, please consult our worldwide directory published at **www.woodward.com/directory**.

You can also contact the Woodward Customer Service Department at one of the following Woodward facilities to obtain the address and phone number of the nearest facility at which you can obtain information and service.

Products Used In Electrical Power Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany:	
Kempen	+49 (0) 21 52 14 51
Stuttgart	+49 (711) 78954-510
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

Products Used In Engine Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany	+49 (711) 78954-510
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
United States	+1 (970) 482-5811

Products Used In Industrial Turbomachinery Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

For the most current product support and contact information, please visit our website directory at **www.woodward.com/directory**.

Technical Assistance

If you need to contact technical assistance, you will need to provide the following information. Please write it down here before contacting the Engine OEM, the Packager, a Woodward Business Partner, or the Woodward factory:

General

Your Name _____

Site Location _____

Phone Number _____

Fax Number

Prime Mover Information

Manufacturer _____

Engine Model Number _____

Number of Cylinders _____

Type of Fuel (gas, gaseous, diesel, dual-fuel, etc.) _____

Power Output Rating _____

Application (power generation, marine, etc.)

Control/Governor Information

Control/Governor #1

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #2

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #3

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Symptoms

Description _____

_____

If you have an electronic or programmable control, please have the adjustment setting positions or the menu settings written down and with you at the time of the call.

723PLUS Hardware Manual

723PLUS hardware manual 02877 is attached after the end of this manual.

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 26425.

PO Box 1519, Fort Collins CO 80522-1519, USA
1000 East Drake Road, Fort Collins CO 80525, USA
Phone +1 (970) 482-5811 • Fax +1 (970) 498-3058

Email and Website—www.woodward.com

**Woodward has company-owned plants, subsidiaries, and branches,
as well as authorized distributors and other authorized service and sales facilities throughout the world.**

Complete address / phone / fax / email information for all locations is available on our website.

2012/10/Colorado