High**PRO**TEC-2 | PROTECTION TECHNOLOGY MADE SIMPLE

MCDTV4-2 | TRANSFORMER DIFFERENTIAL PROTECTION

WOODWARD

NEW FEATURES

- DNP 3.0
- Multiple Communication with one device
- ANSI Menu structure
- Page Editor
- New front plate with USB
- IEC61850 with LC interface

APPLICATION

The MCDTV4 offers an all-in-one solution for HV, MV and LV transformers and it offers much more than just a differential protection package.

Furthermore it can detect critical operation states based on voltage measurement (e.g. Overexcitation). The MCDTV4 provides in addition to that an Interconnection package. This can be used for mains protection at the point of common coupling (e.g. for directional reactive power undervoltage protection). The integrated backup protection package enables the MCDTV4 to act as backup protection (e.g. for downstream breakers). Additional features like demand management are available without extra charge.

COMPREHENSIVE TRANSFORMATOR PROTECTION PACKAGE

→ The Phase and Ground Differential protection package detects electrical faults within the transformer
→ Two elements overexcitation protection (overfluxing)
→ Overload / Thermal replica for detection of long lasting minor overcurrents
→ Six elements (voltage dependent) time overcurrent protection (ANSI/IEC/51C/51V)
→ Multiple power elements (Pr,P,Q,S,PF…)
→ Negative phase sequence protection
→ Multi level overvoltage protection with settable reset ratio
→ Multi level undervoltage protection with settable reset ratio
→ Buchholz supervision via digital input
→ Unbalanced voltage protection
→ Multi-Password-Level
→ Optional temperature supervision via external URTD-box with 12 sensors

RECORDERS

→ Disturbance recorder: 120 s non volatile
→ Fault recorder: 20 faults
→ Event recorder: 300 events
→ Trend recorder: 4000 non volatile entries

INTERCONNECTION PACKAGE

The comprehensive interconnection package is summarized within one menu:

→ Non-discriminating active power direction depending load shedding
→ FRT (LVRT): Settable FRT-Profiles, optional AR coordinated
→ QV-Protection: Undervoltage-Reactive Power protection
→ Automatic Reconnection
→ Considerably frequency protection package: Six elements configurable as f<, f>, df/dt (ROCOF), Vector Surge
→ CB-Intertripping
→ Synch Check options (generator-to-mains, mains-to-mains)
→ Active power flow direction based non-discriminating loadsharing

BACKUP PROTECTION

→ 6 Elements time overcurrent/ short-circuit protection (directional and non-directional)
→ 4 Elements earth fault protection (directional and non-directional)
→ Tripping characteristics: DEFT
ANSI: NINV, VINV, EINV,
IEC: NINV, VINV, LINV, EINV, RXiDG
Thermal Flat, IT, I2T, I4T

PC TOOLS

→ Setting and analyzing software Smart view for free
→ Including page editor to design own pages

COMMISSIONING SUPPORT

→ USB connection
→ Customizable Display (Single-Line, …)
→ Customizable Inserts
→ Intergrated fault simulator: current and voltage
→ Copy and compare parameter sets
→ Configuration files are convertible
→ Forcing and disarming of output relays
→ Graphical display of tripping characteristics
→ 7 languages selectable within the relay

COMMUNICATION OPTIONS

→ IEC61850
→ Profibus DP
→ Modbus RTU or Modbus TCP
→ IEC60870-5-103
→ DNP 3.0 (RTU, TCP, UDP)

CONTROL

→ Up to six breakers (or isolators/ grounding switches)
→ Breaker wear

LOGIC

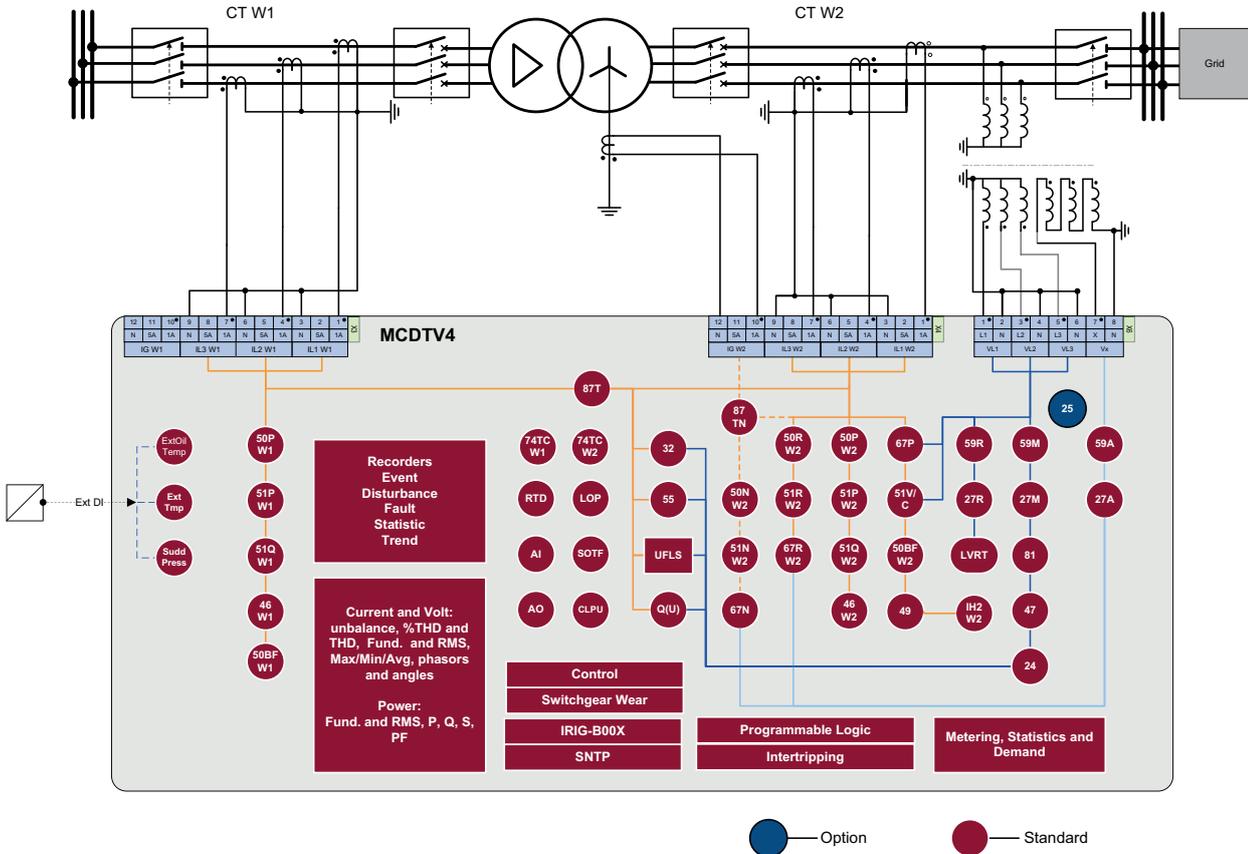→ Up to 80 logic equations for protection, control and monitoring

TIME SYNCHRONISATION

→ SNTP, IRIG-B00X, Modbus, IEC60870-5-103

FUNCTIONAL OVERVIEW

	Elements	ANSI
Protective Functions		
Transformator differential protection, Id>, Id>>	2	87T
Restricted earth fault IdE>, IdE>>	4	87TN / 64REF
I, time overcurrent and short circuit protection Tremendous reset options (instantaneous, definite time, reset characteristics according to IEC and ANSI)	6	50P, 51P, 67P
Voltage controlled overcurrent protection by means of adaptive parameters Voltage dependent overcurrent protection Negative phase sequence overcurrent protection		51C 51V 51Q
I2>, unbalanced load protection with evaluation of the negative phase sequence currents	2	46
ThR, overload protection with thermal replica and separate pick-up values for alarm and trip functions	1	49
IH2/In, inrush detection with evaluation of the 2nd harmonic	2	Inrush
IG, earth overcurrent and short circuit protection, all elements can be configured for directional (multi-polarising) or non-directional supervision. Multiple reset options (instantaneous, definite time, reset characteristics according to IEC and ANSI)	4	50N, 51N, 67N
IE, sensitive earth overcurrent- and short circuit trip, all steps directional or non-directional	4	50Ns, 51Ns, 67Ns
V<, V>, V(t)<, under- and overvoltage protection, time dependent undervoltage protection	6	27, 59
Voltage asymmetry supervision (V012) V1, under and overvoltage in positive phase sequence system V2, overvoltage in negative phase sequence system	6	47
Each of the six frequency protection elements can be used as: f<, f>, df, dt, ROCOF, DF/DT, vector surge, ...	6	81U/O, 81R, 78
VX, residual voltage protection or bus bar voltage for Synch Check	2	27A,/59A/59N
ExP, External alarm and trip functions	4	
Ext Sudd Press: Embedding sudden pressure via Digital Input	1	
Ext Temp Superv: Embedding external temperature supervision via Digital Input	3	
Ext Oil Temp: Embedding external oil temperature via Digital Input	1	
PQS, Power protection	6	32, 37
PF, Power factor	2	55
LVRT (FRT- Low Voltage Ride Through including optional controlled by AR-feature)	27 (t)	27 (t, AR)
Q(V) Protection (undervolt. dep. directional reactive power protection with reclosing disengaging)		
UFLS (non-discriminating active power direction depending load shedding)		
10-Minutes-Mean-Square-Sliding Supervision: adjustable according to VDE-AR 4105		
Synch Check		25
Volts / Hertz	2	24
RTD temperature supervision via optional RTD-Box with 12 sensors		
Control and Logic		
Control: Position indication, supervision time management and interlockings for up to 6 breakers		
Logic: Up to 80 logic equations, each with 4 inputs, selectable logical gates, timers- and memory- function		
Supervision Functions		
CBF, circuit breaker failure protection	2	50BF/62BF
TCS, trip circuit supervision	2	74TC
LOP, loss of potential	1	60FL
FF, fuse failure protection via digital input	1	60FL
CTS, current transformer supervision	2	60L
CLPU, cold load pickup	1	
SOTF, switch onto fault	1	
THD supervision		
Breaker wear with programmable wear curves		
Recorders: Disturbance recorder, fault recorder, event recorder, trend recorder		

Option   Standard

APPROVALS

CE

certified regarding UL508
(Industrial Controls)

certified regarding
CSA-C22.2 No. 14
(Industrial Controls)
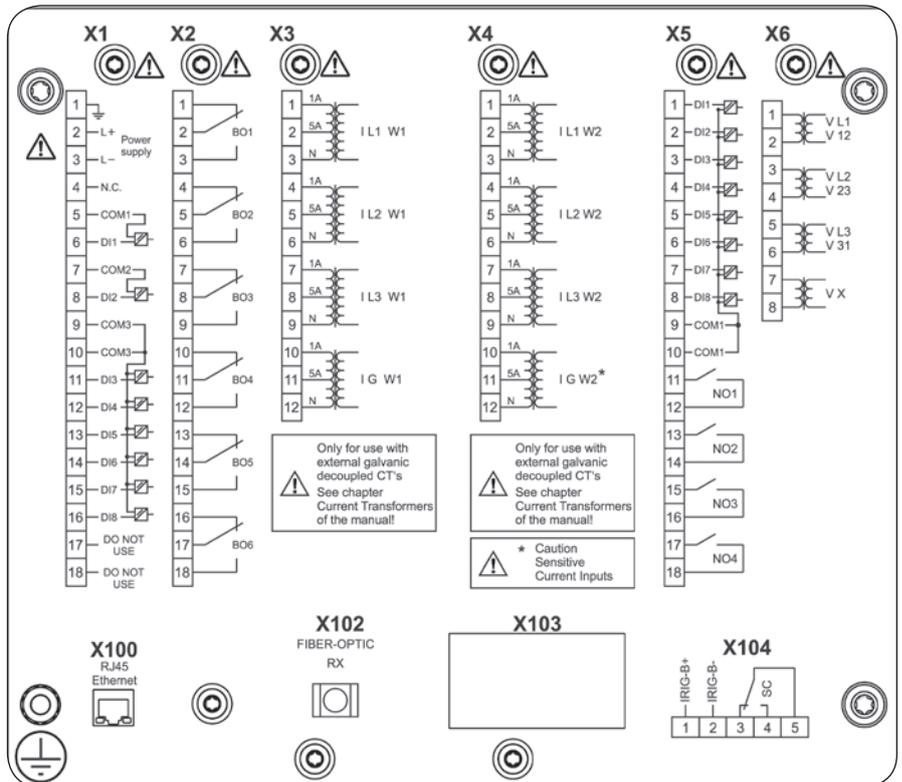
Type tested according to
IEC60255-1

certified by EAC
(Eurasian Conformity)

complies with IEEE 1547-2003
amended by IEEE 1547a-2014

complies with ANSI C37.90-2005

CONNECTIONS *(EXAMPLE)*

ORDER FORM MCDTV4-2

Directional Transformer Differential Protection					MCDTV4	-2				
Version 2 with USB, enhanced communication and user options										
Digital Inputs	**Binary output relays**	**Analog Inputs/Outputs**	**Housing**	**Large Display**						
16	11	0/0	B2	X					A	
8	11	2/2	B2	X					B	
Hardware variant 2										
Phase Current 5 A/1 A, Ground Current 5 A/1 A								0		
Phase Current 5 A/1 A, W1 Sen. Gr. Curr. 5 A/1 A, W2 Gr. Curr. 5 A/1 A								1		
Phase Current 5 A/1 A, W1 Gr. Curr. 5 A/1 A, W2 Sen. Gr. Curr. 5 A/1 A								2		
Phase Current 5 A/1 A, W1/W2 Sen. Gr. Curr. 5 A/1 A								3		
Housing and mounting										
Door mounting									A	
Door mounting 19″ (flush mounting)									B	
Communication protocol										
Without protocol							A			
Modbus RTU, IEC60870-5-103, DNP3.0 RTU	*RS485/terminals*						B*			
Modbus TCP, DNP3.0 TCP/UDP	*Ethernet 100 MB/RJ45*						C*			
Profibus-DP	*optic fiber/ST-connector*						D*			
Profibus-DP	*RS485/D-SUB*						E*			
Modbus RTU, IEC60870-5-103, DNP3.0 RTU	*optic fiber/ST-connector*						F*			
Modbus RTU, IEC60870-5-103, DNP3.0 RTU	*RS485/D-SUB*						G*			
IEC61850, Modbus TCP, DNP3.0 TCP/UDP	*Ethernet 100MB/RJ45*						H*			
IEC60870-5-103, Modbus RTU, DNP3.0 RTU	*RS485/terminals* Modbus TCP, DNP3.0 TCP/UDP	*Ethernet 100 MB/RJ45*					I*			
IEC61850, Modbus TCP, DNP3.0 TCP/UDP	*Optical Ethernet 100MB/LC duplex connector*						K*			
Modbus TCP, DNP3.0 TCP/UDP	*Optical Ethernet 100MB/LC duplex connector*						L*			
Harsh Environment Option										
None										A
Conformal Coating										B
Available menu languages (in every device)										
Standard English/German/Spanish/Russian/Polish/Portuguese/French										

* Within every communication option only one communication protocol is usable.
  Smart view can be used in parallel via the Ethernet interface (RJ45).

The parameterizing- and disturbance analyzing software Smart view is included in the delivery of HighPROTEC devices.

Current inputs	8 (1 A and 5 A) with automatic CT Disconnect
Voltage inputs	4 (0–800 V) or 4 (0–300 V)
Digital Inputs	Switching thresholds adjustable via software
Analog Inputs (Type B)	0...20mA / 4...20mA / 0...10V
Analog Outputs (Type B)	0...20mA / 4...20mA / 0...10V
Power supply	Wide range power supply
	24 V_{DC} - 270 V_{DC} / 48 VAC - 230 V_{AC} (-20/+10%)
Terminals	All terminals plug type
Type of enclosure	IP54
Dimensions of housing (W x H x D)	19″ flush mounting: 212.7 mm x 173 mm x 208 mm 8.374 in. x 6.810 in. x 8.189 in.
	Door mounting: 212.7 mm x 183 mm x 208 mm 8.374 in. x 7.200 in. x 8.189 in.
Weight (max. components)	approx. 4.7 kg / 10.36 lb