

## The Vision Relay Range

The Vision range of relays is a comprehensive range of **Intelligent Protection and Control** products designed to meet the requirements for electrical protection and automation of switchgear.



Vision is a **modular approach** to protective relaying for all IMCS/IPCS (intelligent motor/protection and control system) applications.

A complete suite of high specification protection relays for all low and medium voltage motor, feeder and multiple incomer distribution power systems.



The Vision range embodies our ethos of providing flexible, cost-effective and intelligent solutions to the electrical market sectors



Meeting all high specification oil, gas and petrochemical project requirements, Vision provides a common and consistent relaying platform, providing protection, control and communications integration for LV and MV switchgear.

Designed, developed and manufactured solely at our relay production facilities in Manchester, United Kingdom.

Manchester

## Key Features:

- User friendly and intuitive interface
- Comprehensive range of relays for Motor, Feeder, Transformer & Generator applications
- Designed for long life use in harsh, high temperature environments
- Common and Cost-Effective relaying for both LV and MV applications
- 2 case styles: drawout and non drawout
- Mil and automotive spec components
- PCB layouts designed for optimal heat dissipation
- Isolated inputs and outputs
- Flexible and scalable, single to multifunction programmable protection functions
- Cohesive family of relays for large protection scheme design
- High IP rating of both non-drawout and withdrawable protection relays
- Structurally robust design with high immunity to transients and emc
- Quality system designed to provide continuous improvement for the product life cycle
- Manufactured in the UK using in-house, design, development, production and test resources
- Customer focussed product development and support

## Motorvision (MV2):

Used for comprehensive intelligent protection and control of all LV and MV 3ph motors, whether electrically or mechanically held DOL, 2 speed, reversing drives and star/delta starters.



Motorvision is supplied with a graphical 50x50mm LCD which traces the energising current of a motor during starting.

Designed as the primary component integral to any intelligent protection and control system, motorvision is our flagship relay having supplied units to oil, gas and petrochemical sites worldwide since introduction in 1997.

### Protection Functions:

To suit the specific application, several derivatives of Motorvision exist:

**Advanced Motorvision2 (AMV2)** – Motorvision with dual channel Trip Circuit Supervision (TCS) in large (192mm) case.

**Motorvision2 with RTDs (MV2-XRTD)** – Motorvision with 6 or 12 channels of RTD inputs in large (192mm) case.

Due to the modular construction, Motorvision can also be fitted with a combination of hardware to suit almost any requirement, for instance coupling AMV2 with 3-ph VT inputs and 6 channel RTDs.

## MOTORVISION (MV2)

### Intelligent Protection & Control

High specification relay for all IMCC projects

Intelligent Motor Controller suitable for all AC Motors Re-acceleration

144x96mm DIN Case 50x50mm LCD with 2x Tri Colour LEDs  
12x DIs, 4x DOs, 1x VT, 4x CTs, 1x Aux I/P 80-265V ac/dc or 24-48V ac/dc

ANSI: 9, 19, 27, 34, 37, 46, 47, 48, 49, 50, 50n, 51, 51n, 55, 59, 66, 69, 74, 81, 86

## MicroMotor (MM) & Microfeeder (MF):

Micromotor was designed as our smallest of intelligent devices to provide protection and control for high density, multi tier motor control centre (MCC) projects suitable for a variety of motor starting configurations.

Microfeeder is for application to cable and outgoing feeders providing intelligent feeder protection and control, including overcurrent, earth and voltage protection for power control centres (PCC).

## MICROMOTOR / MICROFEEDER

### Intelligent Protection & Control

<b>MM Relay:</b>	<b>MF Relay:</b>
Remote CT Module	Remote CT Module
High Density MCC Apps	High Density PCC Apps
Intelligent Motor Controller	Intelligent Feeder Controller

96x96mm DIN Case 2 line, 16 char LCD with 2x Tri Colour LEDs  
5x DIs, 3x DOs, 1x VT, 4x CTs, 1x Aux I/P 80-265V ac/dc or 24-48V ac/dc

ANSI: 9, 19, 27, 34, 46, 47, 48, 49, 50, 50n, 51, 51n, 59, 66, 69, 74, 86



The relays allows connection via a remote interposing current transformer (CT) module to either conventional 1A or 5A secondary rated CTs, or for direct motor lead connection via, 1A, 2A, 5A, 10A and 15A rated interposing CTs to motors of up to 11Kw (415V).

The MM & MF relay is housed within a 96x96mm DIN case with a separate din rail mounting CT module connected via a 300mm cable.

## Feedervision (FV2):

Feedervision is employed for multi-staged IEC or IEEE co-ordinated overcurrent and earth fault protection and control of distribution voltage VCBs, fused contactors and transformer feeders.

To suit the specific application, several derivatives of feedervision exist:

## FEEDERVISION (FV2)

### Intelligent Protection & Control

To provide overcurrent, earth fault and voltage protection for incoming or distribution feeders.

192x96mm DIN Case 50x50mm LCD with 2x Tri Colour LEDs  
12x DIs, 4x DOs, 3x VTs, (4x VTs - EFV) 4x CTs, 1x Aux I/P 80-265V ac/dc or 24-48V ac/dc

ANSI: 27, 50, 50n, 51, 51n, 59, 69, 74, 81, 86

### Feeder Protection & Control (FPC)

– housed in a din 144mm case, the FPC is the same hardware content as the MV2 and is often used for cable feeder applications from LV panels.

**Extended Feedervision (EFV2)** – fulfilling the same protection as FV2, EFV2 is equipped with an additional 12 digital inputs and 4 extra relay outputs for flexible interlocking of incomer schemes. EFV2 also has TCS as standard and voltage check synchronisation.



## Advanced Feedervision (AFV2):



AFV2 is used to fulfil the comprehensive scheme requirements to provide all necessary overcurrent, earth fault, check synch and voltage protection with hardwired interlocking for full automatic change-over and momentary paralleling of multi-incomer and bus section systems.

Typically 4x AFV2s are implemented to achieve the selective nature of automatic transfer including all of the protection based decisions, permissive interlocking and involved control logic necessary to provide functional control of auto transfer requirements compliant to Exxon/Esso/Shell specifications.

## ADVANCED FEEDERVISION (AFV2)

### Intelligent Protection & Control

To provide all protective and interlocking functions for automatic transfer of dual incomer and bus tie systems.

192x96mm DIN Case 50x50mm LCD with 2x Tri Colour LEDs  
24x DIs, 8x DOs, 4x VTs, 4x CTs, 1x Aux I/P 80-265V ac/dc or 24-48V ac/dc, 2x TCS I/P with 2x DOs

ANSI: 27, 34, 50, 50n, 51, 51n, 59, 69, 74, 79, 81, 86



# Drawout Series

Vision drawout relays are a mechanically robust and simple construction used predominantly for MV switchgear applications or larger LV drives. Designed to offer a competitive and complete suite of intelligent protection and control as our non-drawout series but also includes more basic protection-only relays for utility and distribution applications.

Withdrawable means that the relay module can be completely removed from the fixed casing and the CT input contacts will then self short.

## 100 Series Relays

### MR-I

Provides IEC or IEEE IDMT curves for 3 phase overcurrent protection.

### MR-E

Provides IEC or IEEE IDMT curves for earth fault or single phase protection.

### MR-IE

Provides 2 setting groups of IEC or IEEE IDMT curves for 3 phase overcurrent and earth fault protection.

Depending upon the application, the 100 series relay is equipped with:

- 100x150mm drawout case
- 2 line LCD with 2x tri colour LEDs
- 2x digital inputs
- 4x changeover contact relay outputs
- 1x Aux Supply 80-265V ac/dc or 24-48V ac/dc
- 1x RS485 Modbus/Profibus
- 1x RS232 front port

Up to 4x CT inputs (3ph + 1EF) or  
Up to 4x VT inputs or combination

### MR-REF

Fast acting restricted earth fault relay for transformer or equipment zoning protection.

### MR-VT

Providing 2 stage under voltage and 2 stage over voltage protection for 3 phase systems.



### MR-CS

Single phase or 3 phase voltage check synchronism (magnitude and angle) protection

### MR-NVD

Neutral voltage displacement relay via an open delta transformer secondary providing protection of predominantly unearthed systems.

### MPR3E5

A comprehensive relay used for 3 phase motor overload, earth fault and negative phase sequence protection.

### 100 Series

#### Protection Relays

Range of basic function withdrawable cased protection relays for LV and MV circuits

100x150mm Drawout Case  
2 line LCD with 2x Tri Colour LEDs

ANSI: 27, 50, 50n, 51, 51n, 59, 59n, 69, 74, 81, 86

## 150 Series Relays

### MR-IED

Directional overcurrent and earth fault protection relay

### MR-DIFF

Providing differential protection for motors and 2 winding transformers.

### Motorvision (MVD)

Motorvision Drawout provides comprehensive intelligent protection and control of all LV and MV 3ph motors, whether electrically or mechanically held DOL, 2 speed, reversing drives and star/delta starters. Motorvision is supplied with a graphical 72x72mm LCD which traces the energising current of the motor during starting.

Comes complete with programmable indicative LEDs and can be optionally equipped with the IEC61850 protocol.

150x150mm drawout case  
72x72mm LCD with 12x programmable LEDs  
12x digital inputs  
4x changeover contact relay outputs  
1x Aux Supply 80-265V ac/dc or 24-48V ac/dc  
4x VT input (Ph-N connection)  
1x RS485 Modbus / Profibus / Ethernet / 61850 rear port  
1x RS232 front port  
4x CT inputs (3ph + 1EF)  
Optional TCS

### Feedervision Drawout (FVD)

Feedervision Drawout is used for multi-staged IEC or IEEE co-ordinated overcurrent and earth fault protection and control of distribution voltage VCBs, fused contactors and transformer feeders.

The large 72mm graphical LCD comes complete with programmable indicative LEDs and can be optionally equipped with the IEC61850 protocol.

TCS functionality can be included if required.

150x150mm drawout case  
72x72mm LCD with 12x programmable LEDs  
12x digital inputs  
4x changeover contact relay outputs  
1x Aux supply 80-265V ac/dc or 24-70V ac/dc  
4x VT input (Ph-N connection)  
1x RS485 Modbus / Profibus / Ethernet / 61850 rear port  
1x RS232 front port  
4x CT inputs (3ph + 1EF)  
Optional TCS

### 150 Series

#### Intelligent Protection & Control

MVD Relay: 3Ph Thermal Overload Earth Fault Intelligent Motor Controller	FVD Relay: 3Ph IDMT Overcurrent & Earth Fault Intelligent Feeder Relay
---	---

150x150mm Drawout Case  
72x72mm LCD with 12x Programmable LEDs

ANSI: 9, 19, 27, 34, 37, 46, 47, 48, 49, 50, 50n, 50BF, 51, 51n, 55, 59, 66, 69, 74, 81, 86

ANSI (FVD): 25, 27, 50, 50n, 50BF, 51, 51n, 59, (67N), 69, 74, 81, 86



## 200 Series Relays

### AMVD

Providing the same functionality as the MVD with the addition of up to 9RTD inputs.

### EFVD

Providing the same functionality as the FVD with the addition of another 12 digital inputs, an extra 4 changeover output relays and voltage check synchronism.

### AFVD

AFVD is used to fulfil the comprehensive scheme requirements to provide all necessary overcurrent, earth

fault, check synch and voltage protection with hardwired interlocking for full automatic change-over and momentary paralleling of multi-incomer and bus section systems.

Typically 4x AFVDs are implemented to achieve the selective nature of automatic transfer schemes (ATS) including all of the protection based decisions, permissive interlocking and involved control logic necessary to provide functional control of auto transfer requirements compliant to Exxon/Esso/Shell specifications.



200x150mm drawout case  
72x72mm LCD with 12x programmable LEDs  
24x digital inputs (12xAMV)  
8x changeover contact relay outputs (4xAMV)  
2x TCS inputs + 2x changeover contact relay outputs  
1x Aux Supply 80-265V ac/dc or 24-48V ac/dc  
3x VT input (Ph-N connection)  
1x VT input (Ph-N or Ph-Ph connection) for Check Sync  
1x RS485 Modbus / Profibus / Ethernet / 61850 rear port  
1x RS232 front port  
4x CT inputs (3ph + 1EF or 2ph + 2EF)  
9x RTD inputs (AMV)

### 200 Series

#### Intelligent Protection & Control

AMVD Relay: Multiple RTDs Large Motors Intelligent Motor Controller	A/EFVD Relay: Additional I/O ATS & Check Sync Intelligent Incomer Feeder Controller
---	---

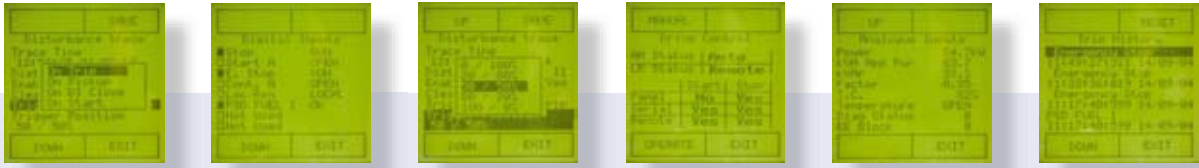
200x150mm Drawout Case  
72x72mm LCD with 12x Programmable LEDs

ANSI: 9, 19, 27, 34, 37, 46, 47, 48, 49, 50, 50n, 51, 51n, 55, 59, 66, 69, 74, 81, 86

ANSI (FVD): 25, 27, 34, 50, 50n, 51n, 59, 69, 74, 81, 86



80 years of **British** Engineering & **British** Manufacturing



## Graphical Display

Fundamental to the Vision range is the use of intuitive and clear LCD interface, the 2 line display is used for physically smaller and protection-only relays. A 50mm Graphical LCD is used for the majority of products within the din-cased Vision range and a larger 72mm Graphical LCD is used for both the 150 and 200 series drawout protection and control relays.

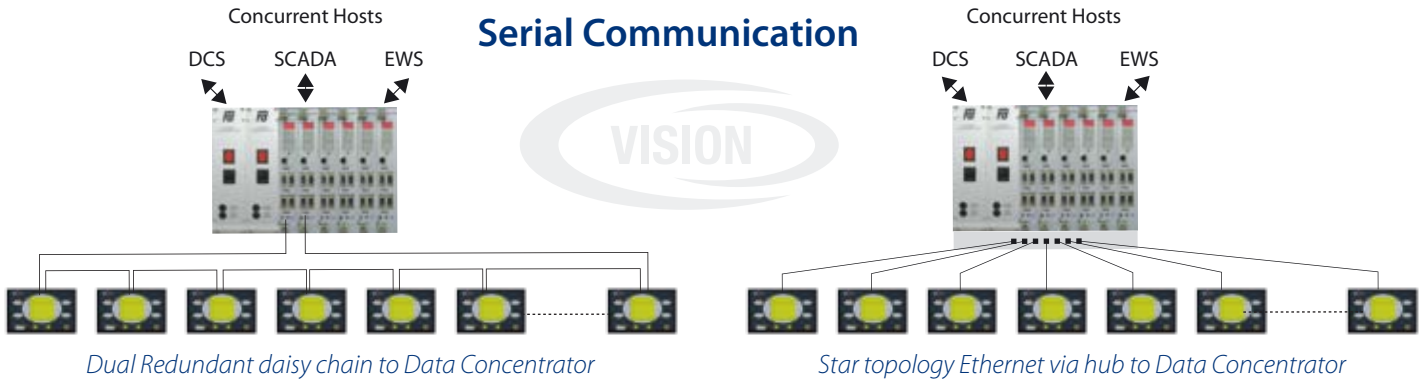
- Clear & Intuitive LCD display and menu structure
- 50mm or 72mm Graphical LCD
- Fixed or Programmable LED indicators
- Access & program ALL parameters, view measured and recorded data
- Automatic backlight power save & programmable screen saver

The sensible menu structure has the ability to display multiple data and parameter settings simultaneously.

During a motor start the inrush current characteristic is displayed and stored allowing comparison to a previously saved start.

The menu structure is easy to follow and once familiar then that knowledge and expertise can be applied to any other device within the range.

## Serial Communication



All Vision relays are equipped with multiple communication ports to allow data interrogation, programming and control.

In most instances the relay behaves as a slave device to the host system (master) and connection is normally made through shielded twisted pair cable.

In recent years, communication topology has played a much larger part in defining the project and equipment specifications. The Vision range provides the flexibility to allow switchgear manufacturers and system integrators to successfully meet such requirements however complex.

Upon request, we can supply most of our relays with the following protocols:

- P&B Network Gold (P&B Standard)
- Modbus RTU
- Modbus TCP/IP
- Modbus ASCII
- Profibus DP
- Profibus DPV1
- DNP3
- IEC 61850

## Contact Details

**P&B Protection Relays**

Belle Vue Works, Boundary Street, Manchester, M12 5NG, UK  
T: 0044 (0)161 230 6363 F: 0044 (0)161 230 6464 E: relays@pbsigroup.com